SEPTEMBER/OCTOBER 2002

# FAA Aviation News

AVIATION SAFETY FROM COVER TO COVER

## Flight 2002

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*FRONT AND BACK COVERS: Breathtaking scenes from last year's 30th International Balloon Fiesta in Albuquerque, NM. (Mario Toscano photos)*

# 31st Albuquerque International Balloon Fiesta 2002

story and photos by A. Mario Toscano

Albuquerque, New Mexico, is ready to stage its 31st International Balloon Fiesta from October 5 through 13 anticipating the participation of more than 750 hot air and gas balloons. The 7th America's Challenge Gas Balloon Race—qualifier for U.S. participants in the Gordon Bennett's Race—is scheduled for Saturday, October 5.

This year is the turn of Art J. Swenka to preside over the 23-member volunteer board that coordinates the world's largest ballooning event.

Last year, with the registration of hot air balloons limited to 750, Balloon Fiesta had, with 20 gas balloons, a total of 770 registered balloons. A total of 707 balloons actually flew in Fiesta 2001, and 907,425 people visited Albuquerque's Balloon Fiesta Park during the nine-day event. A total of 615 media representatives from 202 international media organizations, including the *FAA Aviation News*, covered the event.

Balloons from 41 American States and 25 foreign countries participated in last year's event. The first prize in the hot air balloon competition was awarded to Vail, Colorado, pilot Joel Sturdevant. The team of Peter Cuneo and Barbara Fricke won the 6th America's Challenge Gas Race, and Glen Shaffer and Pat Harwell won the 2nd Annual New Mexico Challenge hot air balloon race.

## 6TH AMERICA'S CHALLENGE GAS RACE

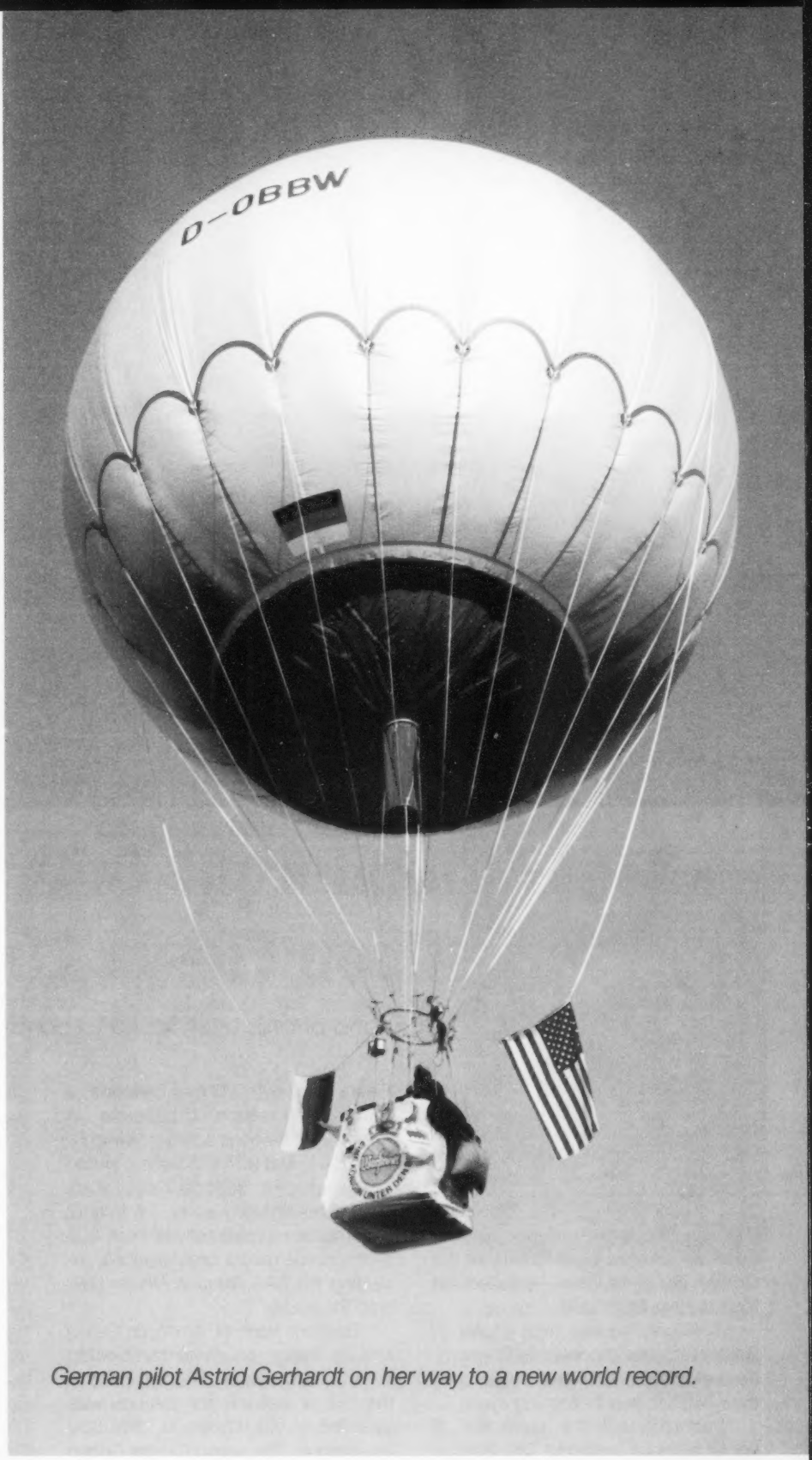
U.S. pilots Peter Cuneo and Barbara Fricke landed near East Liberty, Ohio, and logged 1,302.22 miles to win the 6th America's Challenge Gas Balloon Race. The U.S. team of Richard Abruzzo and New Mexico Governor Gary Johnson, who is a reg-

ular participant in the America's Challenge Race, was second, landing near Juno, Wisconsin, with 1,104.64 miles. The Germany/U.S. team of Wilhelm Eimers and Greg Winker placed third with 1,076.45 miles by landing near Sun Prairie, Wisconsin. Nineteen gas balloons competed, 13 used helium and six used hydrogen as a lifting agent.

German pilot Astrid Gerhardt, who flew in the event as the 20th gas balloon and as a non-competitor, traveled 490.77 miles in 23 hours and 17 minutes to land near Hutchinson, Kansas, thus setting a new distance and duration record for a female solo gas balloon flight. Last March, Ms. Gerhardt was officially recognized for her ballooning record, and awarded the "Montgolfier Diploma" for her achievements in ballooning by the International Ballooning Commission of Federation Aeronautique Internationale (FAI).

The Education Committee of the Albuquerque Aerostat Ascension Association (Quad-A), as it customarily does before each gas race, held a special "Fiesta Safety Seminar" for all participating teams. FAA's Albuquerque Flight Standards District Office, Air Traffic Control, and Automated Flight Service Station personnel presented pertinent information on charts, Air Traffic Control Centers, communications, weather, and flight services among the several topics related to the safety of the race.

Albuquerque's Air Route Traffic Control Center (ABQ ARTCC) headed by Joan Mallen, and especially the manager for Airspace and Procedures, Dave Wingert, had and will continue to have an important role during the race. They coordinate race participants' flight with other ARTCCs across the country, obtain special discrete transponder codes, and assist in tracking and communicating with the gas balloons dur-




*German pilot Astrid Gerhardt on her way to a new world record.*

ing the America's Challenge Race.

## FAA's Albuquerque Air Traffic Control Tower

Albuquerque's Air Traffic Control Tower (ABQ ATCT), in synchronizing its work in support of Fiesta with other FAA facilities, has been instrumental to its success over the years. "It is really a partnership effort for all of our FAA facilities and offices," says Mike Baldridge, Tower Manager.

"The personnel at Albuquerque Tower work very closely with Fiesta officials and participating balloonists. Each year, we provide controllers and supervisors to work at the balloon launch site to ensure that the personnel working in the control tower have instant communications on the launches," explains Baldridge.

Rick Henson, ABQ ATCT Support Manager, has been the focal point for Fiesta for the past eight years, and has successfully facilitated the efficiency of air traffic procedures. Henson works hard at insuring that all participants are aware of the safest way to avoid conflict with airplanes and helicopters in the area.

## FAA's "Temporary Flight Service Station"

The FAA Albuquerque Automated Flight Service Station (AFSS) is scheduled to return for a third year to provide its online and live services directly to the pilots and crews participating in Fiesta 2002.

Last year, Operations Manager Thom Ochello, Jr., had his crew set up a "Temporary Flight Service Station" in the pilots' tent, and each Fiesta day they answered questions, provided maps, projected looping weather graphics on a wide screen, and held pilot briefings upon request.

Albuquerque AFSS personnel also staffed the America Challenge Gas Balloon Race Command Center to provide weather and aeronautical information to race contestants and officials as contenders flew across the United States.

The FAA Albuquerque AFSS direct

support of Fiesta includes general information, automated services, frequencies, weather patterns, flight planning, and pilot briefings. Available maps include the New Mexico topography, weather reporting locations, airspace classification, area AFSS and Air Traffic Control frequencies, Airways-Jet routes, IR/VR routes, and restricted areas. Many of these products are also available through the AFSS web site at <www.abqafss.jccbi.gov> and for a weather briefing over the phone you can call 1-800-992-7433 (1-800-WX-BRIEF).

## THE FSDO IN THE PILOTS AND CREW TENT

The Albuquerque Flight Standards District Office (FSDO) is also scheduled to have its customary remote facility in the pilots and crew tent at Balloon Fiesta Park.

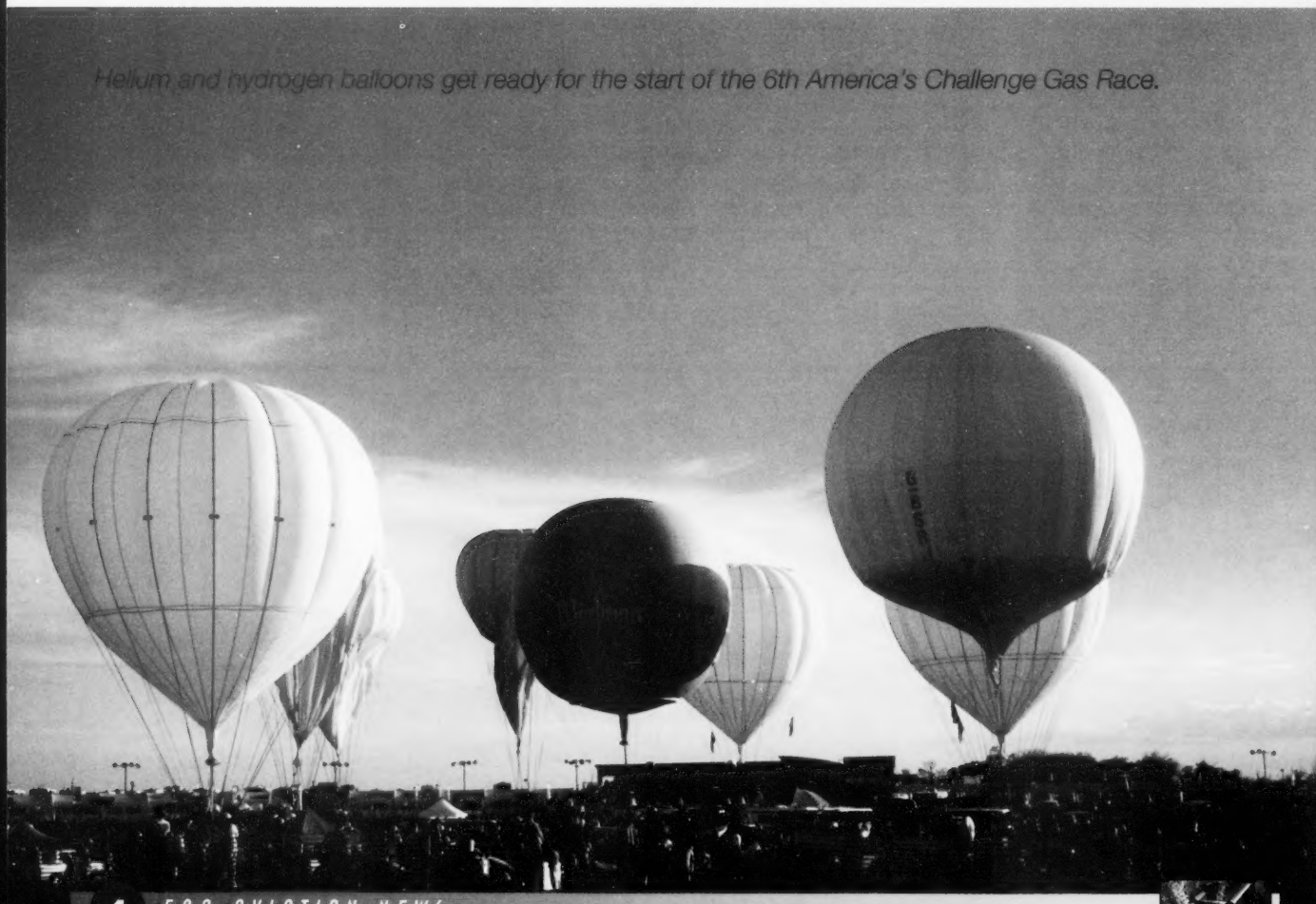
The FAA has the responsibility to review the certificates and currency of all participating pilots, as well as each entrant's balloon's airworthiness. Just like airplane pilots, balloon pilots must also meet Federal requirements for certification. Balloons must be inspected for airworthiness every year or every 100 hours of flight time if flown for hire.

Albuquerque FSDO's J.D. Huss, a senior aviation safety inspector and a commercially rated balloon pilot in both hot air and gas balloons, is the 2002 Fiesta's designated inspector in charge (IIC). In addition to managing the FAA booth from where he ensures that all FAA requirements are met, Huss addresses last minute issues to ensure that Fiesta events are safe for participants and all spectators. To help Huss manage the large workload during Fiesta, the FAA selects and sends several inspectors from neighboring FSDO's to augment the FAA's temporary "office" at Fiesta Park.

## ...AND, NOW, IT'S FIESTA TIME!

Albuquerque is ready for the first Saturday of October. The Dawn Patrol is scheduled at 5:45 a.m. The opening ceremonies beginning nine days of exciting events are scheduled for 6:45 a.m. and the mass ascension is set for 7:00 a.m. The America's Challenge Gas Race lift-off is scheduled for Fiesta's first day at 6 PM.

From inaugural mass ascension to the farewell mass ascension, the gas and hot air balloon races, evening glow spectacles and special shapes ascensions, Albuquerque Fiesta is considered the largest and most photographed ballooning event in the world. In addition to the thousands of spectators who visit Fiesta Park each



*Helium and hydrogen balloons get ready for the start of the 6th America's Challenge Gas Race.*

year, millions see the event on television segments worldwide.

Safety in ballooning and in Fiesta Park during operations cannot be over-emphasized. It is FAA's primary mission as it is for Fiesta's Event Director Pat Brake. Brake instills in all her volunteers—more than 2,000 of them each year—that safety is their foremost concern. The Albuquerque FSDO publicly acknowledges the outstanding job that Brake's team does in keeping Fiesta and Albuquerque's skies safe.

The FAA has succeeded in maintaining the highest safety record through the years at the Fiesta because of this genuine collaboration from the event organizers, their leadership, dedication, and responsibility. All participants are to be commended for it!

If you are a participating pilot or crew in 2002 Fiesta, drop by the FAA booth in the pilots' tent for an AFSS briefing, to see the FSDO team and get a free copy of *FAA Aviation News,* or just to say hello. You'll be glad you did, and so will we!

*Thanks to Karen Adams, Albuquerque FSDO manager and J. D. Huss, Fiesta IIC, for support and help in facilitating our coverage and report on Fiesta 2001.*

# Fiesta 2002

## October 5-13, 2002 • EVENT SCHEDULE

Saturday, October 5
5:45 AM Dawn Patrol Show
6:45 AM Opening Ceremonies
7:00 AM Mass Ascension
6:00 PM Americaís Challenge Gas Balloon Race

Sunday, October 6
5:45 AM Dawn Patrol Show
7:00 AM Mass Ascension
5:45 PM Balloon Glow®
8:00 PM AfterGlow™ Fireworks Show

Monday, October 7
5:45 AM Dawn Patrol
7:00 AM Flying Competition

Tuesday, October 8
5:45 AM Dawn Patrol
7:00 AM Flying Competition

Wednesday, October 9
5:45 AM Dawn Patrol Show
7:00 AM Mass Ascension - Flight of the Nations

Thursday, October 10
5:45 AM Dawn Patrol
7:00 AM Special Shape Mass Ascension
8:00 AM Flying Competition
5:45 PM Special Shape Glowdeo™
8:00 PM AfterGlow™ Fireworks Show

Friday, October 11
5:45 AM Dawn Patrol
7:00 AM Special Shape Mass Ascension
8:00 AM Key Grab Competition
5:45 PM Special Shape Glowdeo™
8:00 PM AfterGlow™ Fireworks Show

Saturday, October 12
5:45 AM Dawn Patrol Show
7:00 AM Mass Ascension
5:30 PM Night Magic Glow
8:00 PM AfterGlow™ Fireworks Show

Sunday, October 13
5:45 AM Dawn Patrol Show
7:00 AM Farewell Mass Ascension

ALL TIMES AND EVENTS ARE WEATHER DEPENDENT
Please visit http://www.balloonfiesta.com/events/schedule.htm for current schedule.

# Ballooning... ON THE WEB

**Albuquerque Flight Standards District Office**
http://www.faa.gov/fsdo/abq/abqhome.html
**Albuquerque Flight Service Station**
http://www.abqfss.jccbi.gov
**Albuquerque Aerostat Ascension Association (Quad-A)**
http://www.hotairballooning.org
**Albuquerque International Balloon Fiesta**
http://www.aibf.org
http://www.balloonfiesta.com
**Federation Aeronautique Internationale (FAI - International Ballooning Commission)**
http://www.fai.org/ballooning
**Balloon Federation of America (BFA)**
http://www.bfa.net
**BFA Jr. Balloonist**
http://www.bfa-jr-balloonist.com/index.htm
**AIBF Jr. Balloonist**
http://www.balloonfiesta.com/Education/academy.php
**Balloon Life Magazine**
http://www.balloonlife.com
**North American Balloon Association**
http://www.eballoon.com

# The Orphan: Phase III

story and photos by H. Dean Chamberlain

A lot has happened since we lasted visited the Orphan in the November/December 2000 issue. For those who may not remember that issue or the July/August 2000 issue, the Orphan is my personal Albatross. It is a 1953 PA-22-135 Piper *Tripacer*. The *Tripacer* was Piper's tube and fabric answer to Cessna's metal aircraft during the 50's and 60's. The *Tripacer* era ended when Piper started producing the all-metal Piper PA 28 *Cherokee* series.

Of all the mistakes and examples of poor judgement I have made and demonstrated in my 55 years, the Orphan has assumed the number one position based upon its costs. Like the Space Shuttle taking off, the costs just seem to get higher and higher. The old saying the sky is the limit is true. The sky has become the limit. Looking back, I have decided that maybe, just maybe, a spouse might be a good thing to have. Sometimes, just sometimes, it might be nice to have to consult someone about a major purchase rather than just making a three-second buying decision. Take it from someone who has been there, done that, and bought the T-shirt—one should never make any decision in only three seconds. Even if you are in a fast food restaurant, you should take a few seconds more to make your decision. Maybe a mandatory second opinion or approval has merit.

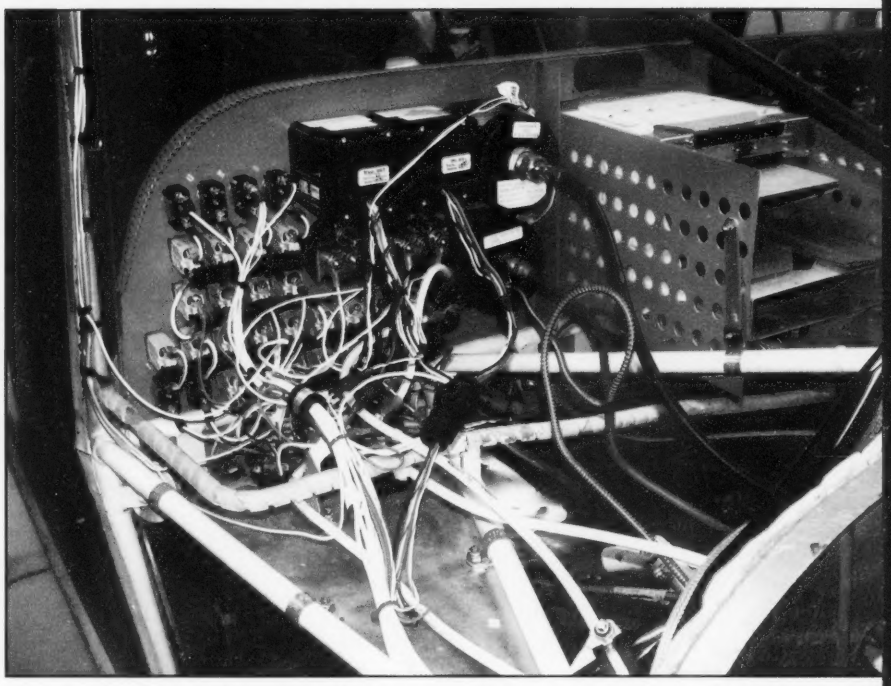
Someone once said, you should learn from the mistakes of others because you won't live long enough to make them all yourself. This article is your chance to learn from my experience. The good news is as a writer, I can make the mistake and then get paid for writing about it. So, at least some good will come out of the lessons I have learned (or paid for) to date.

The first lesson is the most basic—learning is expensive. It takes a lot of money to keep an aircraft in the air. It takes even more money to get one back in the air. I believe it was J.P. Morgan, the banker, who is credited with saying in reference to buying a yacht that if you have to ask the price, you can't afford it. Such is the case with an aircraft. If you have to ask the price, you can't afford it. I used to think that an aircraft could only take off when its paperwork weighed as much as the aircraft. Not true. The correct interpretation is when the weigh of dollars invested equals the aircraft weight and they are in balance, then and only then will the aircraft take flight. But when in doubt about how much money you need to take flight, you should review the spousal reference in the first paragraph.

To add insult to financial injury, the Orphan is currently located (held pris-

oner?) at the only (to my knowledge) government closed then opened and then closed general aviation airport in the country. The Orphan is being worked on at the Washington Executive (Hyde) airfield in Clinton, Maryland. Hyde was one of the general aviation airports closed in the Washington, DC, area after September 11, 2001. Then it was one of the last three to be reopened under very strict Transportation Security Administration (TSA) security procedures. Hyde then failed to comply with those procedures and was closed again by FAA. I have stopped tracking its status since the Orphan is not ready to fly. TSA did permit those few flyable aircraft still based at Hyde to exit the airfield during specified departure windows. The windows were only for one-way trips out. I am not sure how and when the Orphan will depart Hyde. It might be on a truck. Time will tell.

But let's move on to lessons learned.



*It is easy rewiring an instrument panel when the panel forward area is disassembled. This sure beats trying to do the work from under the panel.*

The first lesson was about money. This lesson is about cliches and their meanings in life. Now I understand why my mother use to say, "Do as I say; not as I do." It is easier to tell someone how to do something than to do it. For example, as one who has spent his adult life around aircraft and who earns his living writing about all phases of aviation, I have read and/or heard about all of the things one should consider when buying an aircraft such as a pre-purchase inspection and a title search. But like an addict looking for a fix or an alcoholic looking for the next drink, I let reason fly out the window when I bought the Orphan on a spur of the moment decision. Then, as a new aircraft owner rebuilding an old aircraft I became addicted to getting that next new part. When the UPS man knows you by sight and where to leave your stash of packages, you know you have a problem. If you doubt this is true and want a second opinion, just ask your favorite aircraft supply house order rep about a part or shipment. If they know you by your shipping address and credit card number, you have an aircraft problem. If they ship you catalogs without your having to ask, you have a serious aircraft problem. If they send you Christmas cards, you are in real trouble.

But like love at first sight, your first aircraft may not be true love. It might be infatuation. To guard against the aircraft's siren song, all potential new owners need to set realistic goals and expectations for the aircraft before they buy it or do any major work on it. Beware the temptation of other aircraft. A well-swept wing, a polished spinner, or a glistening rotor blade can tempt the unwary. One must keep focused on the goal: Time in the air. Time on the ground only counts for cars, trains, and bicycles. Aircraft are made to fly. Hangar time does count against one's lifetime. I realize some say that flight hours don't count against one's lifetime, but I think hangar hours do. Remember the goal is time in air at a cost you can afford.

So, what can be done to avoid losing all of those hangar hours? The answer is simple. Do not trust your feelings of love at first sight or flight. Aircraft can be deceiving. Take a walk, shower, vacation, find a spouse, ask a friend, or better yet, your local FAA-certificated mechanic about the aircraft. Look under the gloss and fresh annual for the wrinkles and warts. They are there if you look hard enough. Find someone you trust who owns one like you are considering and ask his or her opinion about the aircraft. Better yet, check the Internet for information since many of the various aircraft-specific type clubs post chatrooms on the Internet. Beware of some of the hype published in some aviation publications. What you want is an objective aircraft commentary, not a sales promo from the aircraft's manufacturer. Advertising dollars can distort objective reporting.

But the first step in the purchase of any aircraft is to determine if you can afford an aircraft. Pilots tend to think only of the direct operating costs of an aircraft. Since most of us start out renting aircraft, we tend to fixate how much will it cost to operate the aircraft per hour. Where we fail, if we are a single owner—not to be confused with someone unmarried—is to understand that all of the aircraft's costs are paid by one person—you

the new owner. And depending upon how many hours that you fly a year determines your hourly flight rate. At the moment, the Orphan's cumulative hourly operating cost is more than $3,000 per hour. Partners are hard to find at that rate.

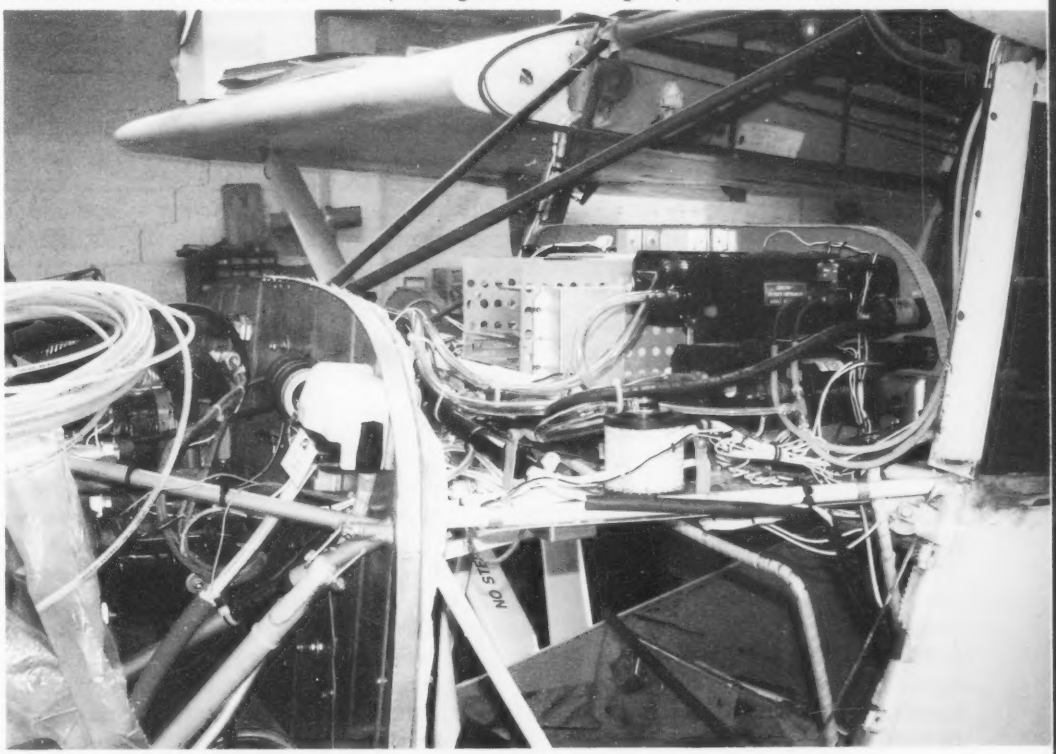
Cheap does not mean inexpensive. Although some might consider good as being good enough, each new aircraft owner must determine his or her acceptable risk level which will help determine your true aircraft cost. Although FAA sets aircraft maintenance standards, they are normally minimum standards. Each new owner must then determine if FAA minimums meet their own personal minimums. Remember that passing through 5,000 feet as you fall out of the sky is not the time to congratulate yourself about how much you saved by buying used wing mounting bolts.

Beware of unapproved parts and dubious maintenance logbook entries. Logbooks tell more by what they don't contain as by what they do contain. You want complete entries with detailed parts lists and complete descriptions of work performed. Although legal according to the regulations, you don't want references to work orders on file at a repair station. The work orders only have to been kept on file for two years at the repair station. Get complete maintenance records by part number of all work performed and keep those records with the aircraft. Be suspicious of unexplained repairs or work entries without a lot of detail. Some mechanics will try to hide damage history by incomplete or vague maintenance entries. Remember a proper repair done right is a good repair. Plus if you keep a detailed record of all the parts in your aircraft and an airworthiness directive is issued for your aircraft involving a specific part, you know for sure if it applies to your aircraft or not because you have documented proof of every part in your aircraft. It also helps if you keep the purchase invoices for the parts you buy. FAA likes documentation.

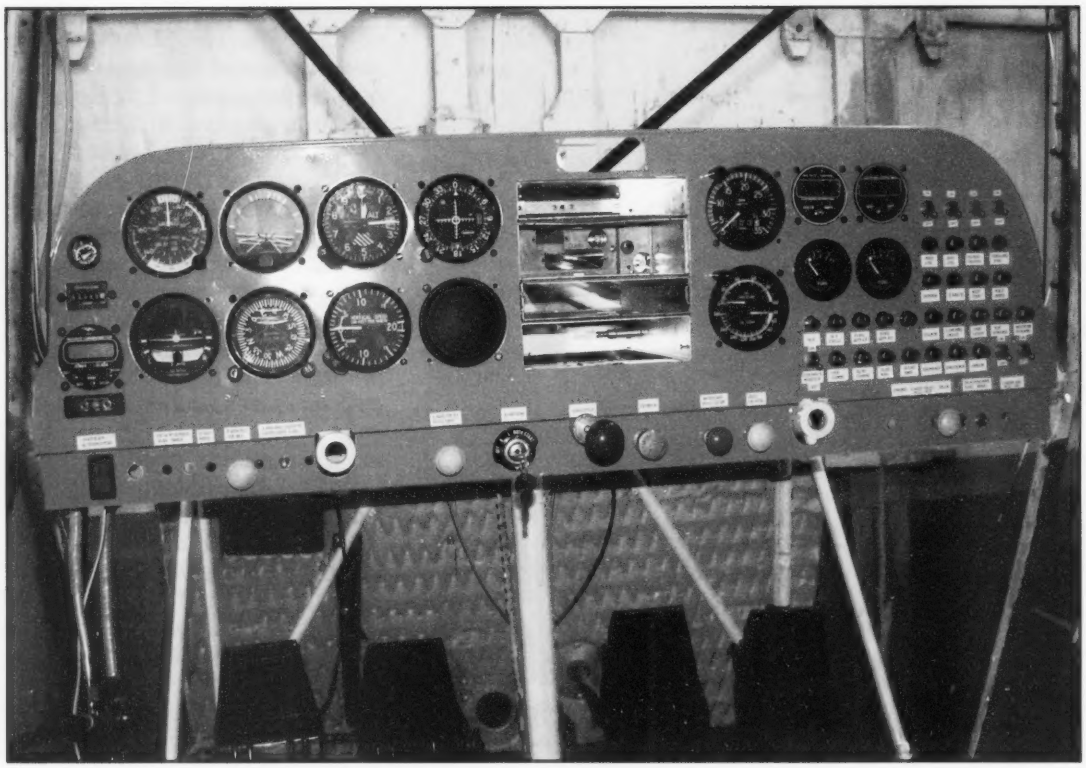
Add in the cost of insurance, which is expensive and which may now have new post September 11 terrorist and war exclusions, the cost of unexpected maintenance and the ever present cloud of the next "annual" inspection, and the cost of a hangar or tie-down space if you can find one. You can begin to see the many "hidden" costs of owning an aircraft. When you add in the purchase cost of the aircraft and the many other costs of owning an aircraft, the need for a realistic budget and income flow becomes critical before you decide to buy an aircraft.

Since different types of aircraft have vastly different purchase costs as well as all of the other operating costs, what type of aircraft you decide to buy plays a major part in your aircraft's total operating costs. The age of the aircraft is also critical to the dollar equation. For example, out-of-production parts or limited production parts cost more than current production parts. In some cases, you may not be able to buy new parts for an older aircraft. You need to review the difference between a rebuilt part and an overhauled part. The same applies to engines. You need to know the difference between a rebuilt, overhauled, and zero-time engine. To learn more about these terms and their importance, you can review 14 Code of Federal Regulations Part 43.

As a general rule, simpler aircraft have lower operating and maintenance costs than complex aircraft. Slower aircraft cost less than faster aircraft. The same is true of single-engine aircraft compared to multiengine aircraft. Fabric aircraft have different maintenance costs than metal aircraft. Hangar space costs more than out-



*From rebuilt engine and nose gear mounts to new firewall to new instrument panel, it is amazing how expensive a few feet of aircraft space can be on an old aircraft.*



*The new panel takes shape. Once the new communications and IFR navigation gear and second course deviation indicator are installed, it is hard to believe this is a 1953 Tripacer.*

side tie-down space. These are some of the costs you must consider when deciding on buying an aircraft. The danger for first time buyers is that we have not had the time to learn that most aircraft are expendable and you can always find another one. As in buying a new car, you have to be able and willing to walk away from an aircraft if the price and capabilities don't meet your expectations and budget. Remember to buy what you want on your conditions rather than what the seller or sales rep wants to sell you. The first rule of ownership is that it is easier to buy an aircraft than it is to sell one.

The key to successful aircraft ownership is balancing wants and needs. In many cases, such as the Orphan, want quickly surpassed need. I didn't need all new flight and engine instruments. I just wanted them. The problem was the aircraft was not designed for what I wanted. And in the case of the Orphan, it would have been cheaper and smarter to buy a new aircraft and have all of the benefits of a new aircraft.

One of the most important benefits is the warranties on installed equipment. Not only is it important to establish a critical drop-dead budget before any aircraft purchase, but it is equally important when rebuilding an aircraft to set realistic cost projections and realistic timelines to complete the work. In the case of the Orphan's out of control costs and timelines, all of the factory warranties on all of the new instruments and avionics equipment such as the IFR GPS and VOR/ILS/Comm gear expired before they were installed. I learned that not only do many aircraft items have a specified hour-limited warranty and/or a limited number of months, but many items also have a shelf-life-limited warranty. When the first limiting number comes up, hours, months, or shelf life, there goes the warranty. Even if your warranty is expired, it is important to complete and send in equipment registration data cards. Companies must be able to contact you in case of problems with their products. For example, my new communications/navigation unit had an airworthiness directive against it before it was out of its box. The moral here is to set realistic project completion dates and buy your warranted equipment at the end of the project to maximize your protection. You paid for the warranties; you should benefit from the protection you paid for.

Not only do you need to establish and track equipment warranty periods to determine when to buy the gear, but you need to wait until the end of your project to buy some of your electronic gear. The GPS I bought for the Orphan not only has lost its warranty without ever being installed, but it is now three generations old. Even though it has not been installed yet and never powered up, for resale purposes, it is obsolete. To add insult to injury, I paid a lot of money for it when I bought it at the EAA AirVenture fly-in at Oshkosh several years ago thinking I was saving money by buying it at the end of the weeklong fly-in. Again, this was a vague, impromptu, three-second-purchase decision. The moral here...cheap does not mean inexpensive and do not make three-second decisions. Then to add another insult to my astute buying prowlness, the then current data card for the GPS ex-

pired long before the item was ever taken out its box. This is another example of value lost because of poor decision making.

As noted earlier, time has value in any aircraft project. For those of us who do not hold an FAA aircraft mechanic's certificate and therefore have to pay someone for those critical services, long projects can become expensive not only because of the equipment and parts costs involved, but because you have to pay someone for his or her skills. Without well-defined deadlines and expectations, these costs can exceed the value of the project. A smart owner will establish a well thought out work project that lists both the cost of the required parts as well as the time to do the work. Or as I have told the person working on the Orphan, when his yet to be received bill equals the cost of the aircraft, I am just going to give him the aircraft keys. The good news is the keys will start the aircraft. Gone is the classic hidden *Tripacer* start button. And if the battery ever runs down, he will not have to remove the one-piece front seat to remove the battery. He will only have to plug in the new Piper jumper cable into the custom external power receptacle under the front seat.

Although another old cliche states time is money, in aviation time has another value. For those of us who live in less than year-round perfect flying weather areas, if a project is not finished before the good flying season starts, you have effectively lost a significant portion of your flying year. So you must consider the utilitarian value of your flight time when calculating the cost of buying an aircraft or doing major work on it. If you want to maximize your flying time, buy an aircraft that is flyable rather than a project or an aircraft that needs work.

As the person doing the work on the Orphan will attest, the Orphan's owner's availability to do grunt work with him on the aircraft varies inversely with the cost of the latest part. Or to better phrase it—so goes the money so goes my interest. Like many things in life, an aircraft being rebuilt has a continuing cost whether it moves or not. Add in all of the costs listed above and place the aircraft in someone's hangar that has to be paid for and the project's costs continue to rise. For example, I have paid for aircraft insurance and my own hangar costs for more than two years while the Orphan has been torn apart for maintenance in someone else's hangar. It is hard, if not impossible, to just put a major project on hold and not have costs continue. Since an owner can do a lot of work under the supervision of a certificated mechanic, you have to have the time and dedication to see the project through. It is easy to lose interest in a long-term project. You have to know your own limitations and skills.

Another project cost that many don't think about is the cost of what I will call the "mistake." Since I am working with an individual and not a company, I have to be prepared to assume all of the liabiiity or "mistake costs" for the project. For example, when three instrument panel blanks were cut wrong, I paid the bill for the three plus the fourth panel. When a part was damaged, I paid the bill. When a particular job takes longer than expected because the person doing the work has to experiment and learn how to do the particular job, you have to pay for that learning experience. If you had a contract with a company, you would expect the company to complete the agreed upon work at the agreed upon cost. The company would have to pay for any damaged materials or to learn how to do something right. This is why in many cases, I think it is cheaper, faster, and you get a better job if you hire an expert who does the type of work you need done every day. The initial cost might be higher, but you get the job done on time and on budget. Plus it is easier to yell at a company when you are not happy with it than it is to yell at a friend working on your airplane. This is especially true when your airplane is in parts in his hanger located many miles from your own hangar. Fortunately in my case, the person working on the Orphan is both talented and patient. When I don't show up, the job gets done. When I whine, he ignores it. When I complain about money, he is sympathetic. But mistakes do and will happen, so you have to be prepared for them, both emotionally and financially.

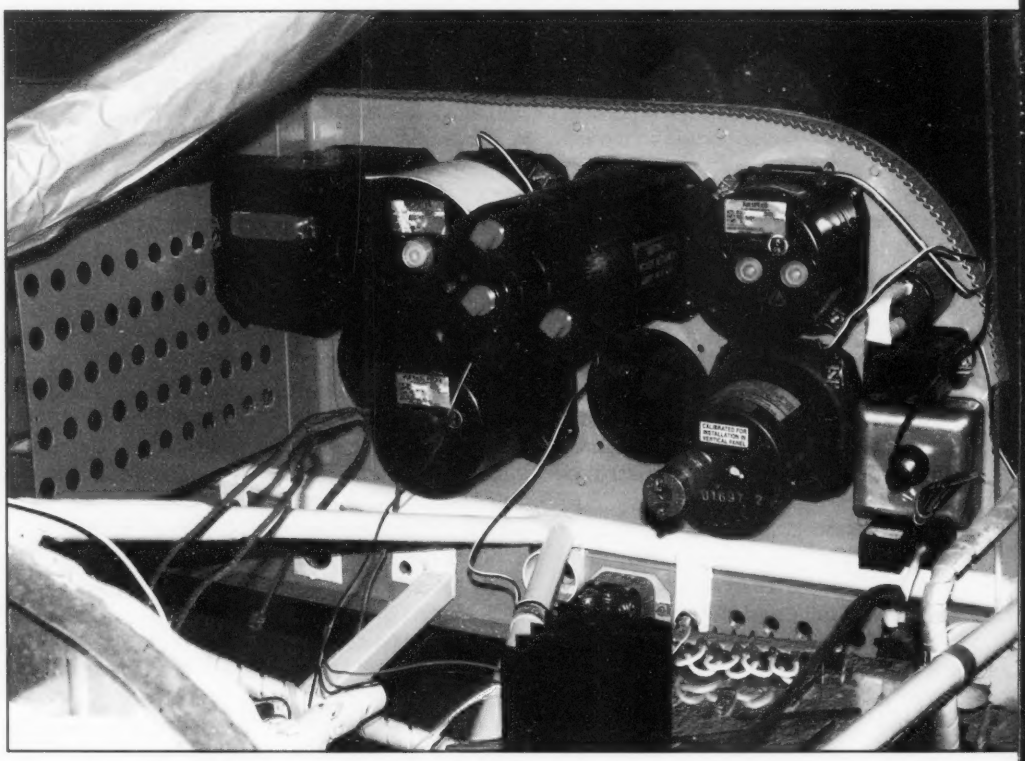
The final comment about the Orphan is what I call the time factor. If you are involved in a long-term project, you have to be aware of the time factor. For example, the Orphan's spiral descent into maintenance obscurity began with a simple comment, "If we just take out the window, we can get to the rudder pedals easier." Like many things in life, a simple comment can lead to serious long-term commitments both in terms of money, time, and lifestyle.

This Phase III article has touched briefly on some of the costs many of us don't think about when buying an aircraft. But the article has not touched upon one of, if not the most important, issues of owning and being involved in a major project. Time and lifestyle changes brought about by the project. The Orphan has changed my life forever. As one who use to think nothing about flying to Hawaii for a weekend, those days are gone as well as the money to do those types of things. Anyone thinking about buying or starting any type of aircraft project, must stop and consider his or her own personality and abilities. I am a pilot who writes. I also have a very bad habit. I love to buy tools. Note: I didn't say I necessarily love to use them. I just have never met a tool I didn't like or want. I realized early in my young life as I was working on military aircraft in the cold of winter and the heat of Southeast Asia, that I would rather travel on an aircraft than work on one. I love the challenge of understanding the design and maintenance aspects of aircraft (finding and buying aircraft parts are some of the most expensive fun you can have), but I have come to the realization that I am not the dedicated restorer of aircraft like those I have seen at many airports and at such organizations as the Experimental Aircraft Association and at the National Air and Space Museum's

restoration facility. As I said at the beginning of this article, it is easier for me to talk about an aircraft than it is to work on one. If it wasn't for the dedication and professionalism of the person working on my aircraft, the aircraft would still be in parts instead of being put back together. If I were he, I would have fired me long ago. I am a better buyer of parts than I am a worker. I can't remember how many times in the past two and a half years, I have lost interest in the project. But I do seem to remember a definite lack of interest every month about the time when the credit card statement was due. So I think it is critical to the success of any aircraft project that the person wanting to start such a project take a realistic look at his or her willingness to dedicate a lot of time and resources to the project. If you have other commitments or are not willing to or unable to dedicate the time and effort necessary to complete the project, you might want to reconsider starting it. Fortunately for me, the person working on the Orphan is frankly, a lot more dedicated to the project than I have been. At one point, when he called me with the good news/bad news scenario that I have come to fear and dread, his good news was the parts were available, the bad news was they were expensive. I will not repeat my comment to him. But like having a baby or bringing home a new puppy, you have to hope that at sometime in the future, they will both be old enough to play outside. Such as with a project, at some point you have to hope it will be finished enough to take it outside and fly it.

Not only do you have to assess your own commitment to the project, but you have to assess how you want to get the work done. A friend of mine is doing the work. He has a full-time job so he normally can only work on the Orphan on Saturdays. He cannot work on the airplane every Saturday so some weeks nothing gets done, some weeks a lot gets done, and some weeks a little gets done. All of which has contributed to the project's delay. Could things have been done faster? Yes. I could have done more, been available more, or have sent the aircraft to a repair shop to have the work done. So, why didn't I do all of these? First, I didn't understand the extent of the work or the cost. Second, since the person working on the aircraft owned a later model of the aircraft, he knew more about the aircraft type than many people in the area did. Plus I am cheap. I wanted to save money. This whole project started with an annual inspection that was expected to be simple and easy to do. But such was not the case. The project just grew out of control. Want overcame need. With its dynamic growth, the project lead to frustration which lead to indifference which lead to resignation. Does some of these sound like the dangerous pilot attitudes one studies in ground school? All of which took a lot of fun and money out of my life for more than two years. Trust me—after all I am from the FAA—when I tell you that the only way to experience the highs and lows of aircraft ownership is to buy one. The good news is that the Orphan is slowing beginning to look like an airplane again. In fact, it may be flying by the time this article is published. It might get off the ground sometime this century. Now let's see, where can I fly to? How many hours is it to Florida in a newly upgraded *Tripacer*?

You too can start the project of a lifetime by buying an aircraft. Just remember, aircraft are like puppies, once you bring one home, you have to take care of it and take it out and play with it. Just remember to take your time and get the pick of the litter. ✢



*It took four tries to make a custom panel to fit all of these flight instruments into an aircraft almost 50 years old. The challenge was in fitting them around the structural tubing.*

# Flight School Security

by Daniel J. Benny

The recent incident involving the theft of a Cessna 172 in Tampa, Florida, and its deliberate crash into an building, along with concerns over aviation security since the September 11 terrorist attacks, demonstrate the need for flight schools, general aviation airports, and aircraft owners to do all they can to ensure the security of their aircraft. This increased security is important for many reasons. It can aid in preventing the theft and use of aircraft as terrorist weapons which is a primary public concern at this time. Security measures can also reduce the threat from traditional criminal activity and motives such as the theft of aircraft for illegal drug trafficking, joy rides, and theft of avionics.

Being a litigious society, the failure to provide adequate security of aircraft could lead to successful lawsuits against flight schools, FBOs, airports, and aircraft owners. Security precautions will also be assisting in reducing or maintaining lower insurance rates for both liability and hull coverage of the aircraft.

Over the last year, there have been periods in which flight schools were unable to operate because of restrictions in airspace related to the recent terrorist attacks. In order to prevent increased government restrictions and regulations on flight schools and general aviation, it would be more palatable for the general aviation community to establish and adhere to their own voluntary security standards. This gesture would go a long way in preventing mandated government restrictions and security procedures for flight schools and general aviation.

The level of security that can be provided by a flight school depends on several factors. As is the case of Reigle Aviation, located in Palmyra, Pennsylvania, were I hangar my Cessna 150, they own Reigle Airport (58N) and the FBO and operate a flight school. In this situation, they have complete control over the entire airport facility and flight school-owned aircraft and are unlimited in the level of security measures they can implement. In situations where the flight school is operating as a tenant at a general aviation airport, they will be limited in the security measures they can implement.

While no measures can guarantee the security of aircraft, a flight school can establish security procedures to reduce the risk of theft or misuse of aircraft. Security begins with the hiring of staff and flight instructors. A thorough background investigation should be conducted on all applicants to verify their identity, work history, criminal history, emotional stability, and verification of appropriate credentials for flight instructors. This can aid in preventing individuals with long-term terrorist or criminal goals from being able to insert themselves into a flight school operation in which they themselves could have access to aircraft or be in a position to allow other potential unauthorized individuals to gain access to aircraft.

The next step is to establish written policies and procedures covering security of the flight school and to ensure that all staff members and instructors are trained in, understand, and follow the established procedures. The mere fact that written procedures have been established is of little value if they are not followed. These procedures should cover the screening of potential flight students, physical security of school aircraft, and control of

access to the aircraft.

The screening of flight students is critical in the prevention of the misuse of aircraft and terrorist incidents. The flight school staff should interview all potential students and verify their identity. Students who are not of age to obtain an FAA medical certificate should be required to obtain one from their own physician indicating that they are physically and mentally cleared to participate in flight training activity. Flight schools might consider initiating background checks of students, including a criminal check—if authorized in their state—and reference checks. Staff should be trained to look for possible indicators of terrorist intent, such as students paying for training in large sums of cash or showing an interest or requesting training in only certain areas of flight to the exclusion of other areas that are critical to the full certification process. Other indicators are students who suddenly leave the program without explanation or act in any manner that appears suspicious or inconsistent with obtaining full flight certification. Potential students should also be observed and screened for any obvious mental or emotional conditions. If any of the above indicators appear during the course of flight training, the student should be reevaluated for suitability to continue.

Physical security and the control of access to flight school aircraft are important aspects of the overall security program. All keys to aircraft should be accounted for and maintained in a locked key cabinet when not in use. It is also recommended that the doors to the aircraft and the ignition be keyed separately. Aircraft when not in use, especially when secured for the night, should be maintained in a locked hangar, with intrusion detection systems if possible. Other security measures could include prop cable locks, throttle locks, or wheel boots in addition to locking doors and securing the window of the aircraft. The use of signage indicating that access is restricted and that tampering with aircraft is a violation of the law, along with the use of adequate security lighting, should also be considered as part of the security program.

Student access to aircraft must be controlled. Flight schools might consider issuing all students a flight school photo identification card upon registering with the school or at a minimum, be required to show a driver's license or other form of photo identification. Students should check in with a staff member upon arrival at the school and never be provided with a key to obtain access to an aircraft without the knowledge of their flight instructor. As mentioned earlier, the door lock and ignition should be keyed separately. Students should sign for and only be given the door key to the aircraft if they are going to be doing a preflight of the aircraft on their own. The flight instructor should then hand carry the ignition key to the aircraft before beginning dual flight instruction. Students permitted to conduct solo flights should sign for both door and ignition keys.

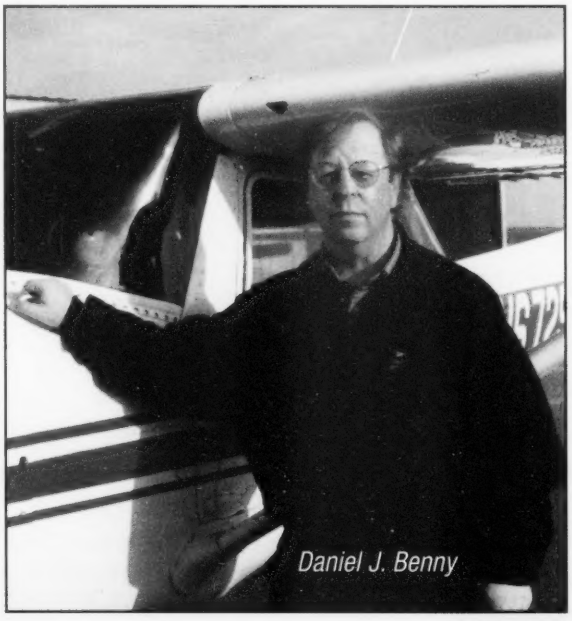
While there are no flight school security measures to prevent a solo student from misusing an aircraft when they are airborne, by following the recommended screening procedures and monitoring the student during the dual instruction period, the risk of a student misusing an aircraft for terrorism or other unauthorized purpose will be greatly reduced. Should an unfortunate incident occur in spite of taking security measures, it would certainly provide insulation to the flight school with regard to liability and failure to provide adequate security of the aircraft.

A final consideration for flight schools who rent aircraft to certificate holders: any individual wishing to rent an aircraft should be screened, including verification of identity by comparing the FAA certificate with a photo driver's license. The inspection of a current medical certificate and a review of the pilot's logbook should also be part of the screening process. Indications of any suspicious activity or motive for the rental of the aircraft should be looked for, such as paying in large sums of cash, asking questions about specific buildings or facilities in the area which could be potential terrorist targets, or any unusual luggage or packages to be taken aboard the aircraft.

It is vital that flight schools and general aviation take the initiative to establish increased security at their facilities in order to ensure the safety of the United States and the continued support of the general aviation by the public.

*Daniel J. Benny, M.A., CPP, is a licensed Private Investigator and Security Consultant in Harrisburg, Pennsylvania. He is a private pilot and owner of a Cessna 150, volunteers as an FAA Safety Counselor, and is a MAG and safety Officer with the Civil Air Patrol. He may be contacted by telephone at (717) 540-9236 or by email at <DJBennyPI@aol.com>.*

*The recommendations contained in this article are consistent with recently issued FAA recommendations. Flight schools are in no way required to use any of them.*



*Daniel J. Benny*

# www.opspecs.com

by Wayne Fry

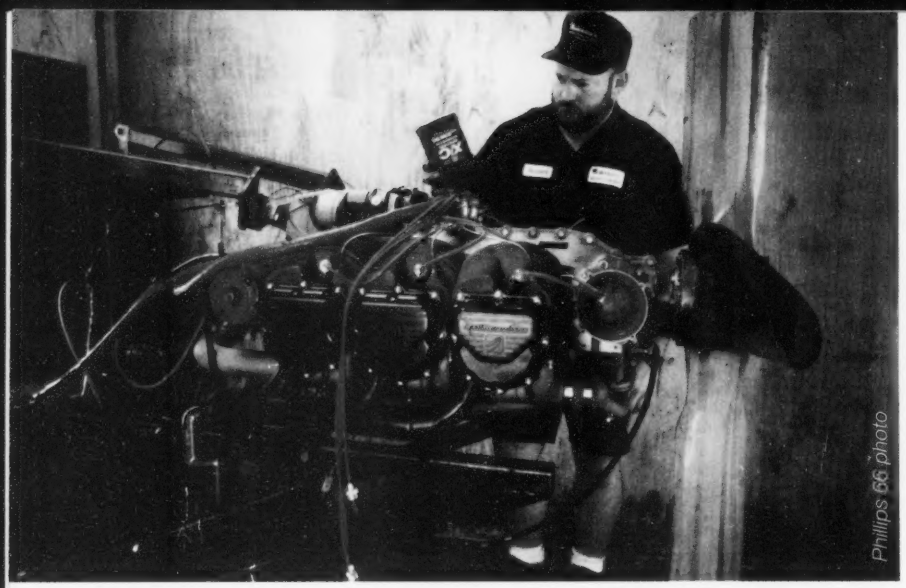
Phillips 66 photo

A few years ago I was giving a presentation about the benefits of using the Internet to a large group of IA's. About half way through my speech, an elderly gentleman stood up and glared at me. He looked me in the eye and wanted to know why I was trying to turn him into a computer programmer. He further told me that he was an A&P and that all he wanted to do was work on airplanes, not play with computers. He didn't own a computer, would never own a computer, and thought that they were a waste of time. I could hardly argue his last point; I have wasted far too much time at my computer. That said, I'm amazed at how much I've come to rely on computers.

The FAA makes extensive use of computers. When our system is down, I feel like a mechanic without a rollaway. We use a lot of different programs, many of them written just for the agency. One of the programs that truly appeals to me is the IOPSS program. I like it because it saves you and me the most precious of commodities—time. Since this is a relatively new program, I thought I'd give you a quick tour to show how you can benefit from it. I think that it'll be especially attractive to you folks out there who run repair stations and air charter companies.

What is IOPSS? IOPSS stands for Industry Operations Specifications (OpSpecs) System. It's a program that allows you to amend and sign your own OpSpecs, and then send them to your FAA inspector without leaving the comfort of your office, and without the hassle of overnight mail or hand deliveries. To complete the process, it allows your inspector to do the same. Very nice.

As most of you know, the FAA is required by Title 14 Code of Federal Regulations Part 91 to issue Operations Specifications to operators and agencies. The system as we know it today has been around a while, but only since the 1980's has it been automated (computerized). Over the past few years, the software has been updated and improved. Those of you who have OpSpecs, know how important they are. They are the legal contract between your company and the FAA, outlining your special authorizations and limitations as a certificated entity. If you are a repair station, your OpSpecs state your limitations, such as the aircraft, engines, accessories, etc., that you are authorized to work on. If you are an air carrier or an On-Demand Air Taxi operator, your OpSpecs may be very lengthy and authorize where you can fly, the aircraft that you operate, and a laundry list of other items. And since the FAA con-




siders these to be a contract and a legal document, we sign them on behalf of the FAA Administrator, and you, or someone else in your company, sign them on your behalf.

Amending or updating OpSpecs has not always been a speedy process. If you are located across the field from the FSDO, it's not a big deal. You just mosey on over to the office and take care of business. But if you're several hundred miles away, it can be a real hassle. Before I joined the FAA, I can remember driving to the Baton Rouge FSDO early one morning to get my OpSpecs updated to include a new shop for the repair station. I got up at 4:00 a.m. and drove down I-10 to the FSDO to hand in the old OpSpecs and sign the new ones. The drive took me two hours each way. I had a very good principal maintenance inspector (PMI) and he had done the same thing on previous occasions, so we took turns going to each other's place of business. If IOPSS had been available back then, we could have done it all over the Internet, in about the same amount of time it took us to brew our morning coffee.

So what is involved? There are two critical parts to IOPSS. The first one is the software itself that allows you, the operator, to access your OpSpecs and update them. The second is the electronic signature. You need both to make the system work. The program allows you to use your computer/modem to access your OpSpecs through the Internet. The FAA installs the software on your computer and trains you how to use it. Once this is accomplished, you go to the website and select the paragraph you wish to update. You make your changes and then sign it electronically. Once this is done, you notify your principal maintenance inspector. He or she reviews the changes, and if they are okay, he or she also signs them electronically. That's it. You now have your new OpSpecs and no one had to drive cross-country. Ain't technology great?

As with any innovation, you pay a price. But not to the FAA! The FAA doesn't charge for anything. You will get your FAA training, software, and the chance to bond with your inspectors at no charge. You will need a computer that has certain capabilities, but nothing outrageous. However, ARINC, the company that provides the technology for the electronic signatures, does charge. Currently, each person who gets an electronic signature or "certificate" is charged a $100.00 initial fee and then an annual fee of $60.00. So, a typical operation that has one person signing their operations paragraphs, and one person signing their maintenance paragraphs, would pay a $200.00 initial charge, and then $120.00 per year for this service. Seems like a small price to pay for this service. The information about ARINC is available on their website at <www.ARINC.com>. The FAA maintains a website for OpSpecs, called <www.opspecs.com>, where program documentation can be downloaded.

Once you've decided that you want to get involved in this new technology, what should you do? First, go to the OpSpecs website and read the material. It explains the system, tells you what you'll need, and how the process works. Just type in <www.opspecs.com> into your Internet address. Then click on the part that says "IOPSS." Scroll over to the window that says "A Guide for FAA Personnel to Deploy Industry OpSpecs." Click on this and you will find everything you need to know. In fact, there is a section, Appendix A, that is a guide for industry personnel. Second, coordinate with your local FSDO. Let them know that you are interested in this program. The FSDO will set up the training and coordinate with the other FAA personnel who will be involved. Once you've set up your training date, the FAA trainers will come to your local FSDO and train you and your FAA inspectors on how to use the system. This is real time usage and, when you're done, your OpSpecs will be configured and signed. ARINC will also be involved to issue the digital signature certificate, and the FAA inspector should coordinate that visit as well. Normally, it coincides with the FAA visit.

Now that you know it's available, you and only you can decide if it's worth the price. If you are a single pilot, no manual 135 air carrier, and you change your OpSpecs once a decade, you probably wouldn't want to spend the money. But if you are a large operator and have a fleet of aircraft that is constantly being upgraded, you might be interested. Or if your repair station is growing and expanding, you might want to consider it. It's a great option if you're located a long way from the FSDO and are tired of making the drive each time there's a change.



*Wayne Fry is an Aviation Safety Inspector-Airworthiness in Flight Standards' Aircraft Maintenance Division.*

# Internal Evaluation Program

Boeing photo

## A voluntary partnership program that will benefit the air carriers, the repair stations, and the public

by Salvatore Scalone

The concept of an Internal Evaluation Program (IEP), as defined by the Federal Aviation Administration (FAA), was developed in the 1980's as part of several FAA initiatives to improve the partnership between the FAA and the air carrier industry. Although the FAA considered mandating an Internal Evaluation Program as a regulatory requirement that an air carrier have a program to verify its operations were in continuous compliance with the Federal aviation regulations, the FAA ultimately decided a voluntary program would be more consistent with partnership efforts. Advisory Circular 120-59, Air Carrier Internal Evaluation Programs, was issued October 1992 and was supported by the Air Carrier Internal Evaluation Model Guide developed earlier that year by the Phaneuf Associates, Inc. In September 1995 the suggested IEP was extended to the repair stations when Advisory Circular 145-5, Repair Station Internal Evaluation Programs, was issued. This program gives management a tool to systematically evaluate the effectiveness of its management systems and anticipate non-compliance—before it becomes non-compliance.

A National Program Review of the Air Transportation Oversight System (ATOS) air carriers in 2000 and Assessments of Part 121 Eastern Region air carriers in 2001 indicated that most of the carriers that have an internal evaluation program were not obtaining the maximum benefit from that program. Both the National Program Review and the Assessments of these carriers revealed a common finding: The majority of air carrier's examined did not have an IEP that was consistent with the advisory material issued by the FAA. Often their IEP simply duplicated the air carrier's Continuous Analysis and Surveillance Program and did not evaluate the overall effectiveness of the air carrier's management or management systems. The FAA believes that air carriers and repair stations that have internal evaluation programs, which are consistent with FAA advisory material, would achieve the maximum benefits from those programs.

Benefits of an internal evaluation program can go well beyond the verification of regulatory requirements. Methodical and planned systematic self-examination may disclose to management areas where added cost savings can be achieved or efficiencies increased. It can also be used to determine the probability of expansion or reduction consequences. Both extremely important to an air carrier or repair station that must make the necessary adjustments to accommodate such changes.

There is no regulatory requirement for an IEP. However, the FAA encourages each air carrier (Parts 121/135) and each repair station (Part 145) to develop and implement an IEP as rec-

ommended in the advisory material. Such a program will increase the awareness of management and all employees of their responsibilities to promote continuous compliance with all regulatory requirements and good operating practices. The program will help certificate holders develop formal compliance monitoring programs and will verify continuous compliance and anticipate non-compliance before it becomes non-compliance. Participation is left solely to the discretion of the certificate holder. This method of self-surveillance is consistent with FAA's policy, which encourages certificate holders to identify, correct, and voluntarily disclose instances of non-compliance. Those certificate holders who implement an IEP remain eligible to disclose under the Voluntary Disclosure Reporting Program (AC 00-58).

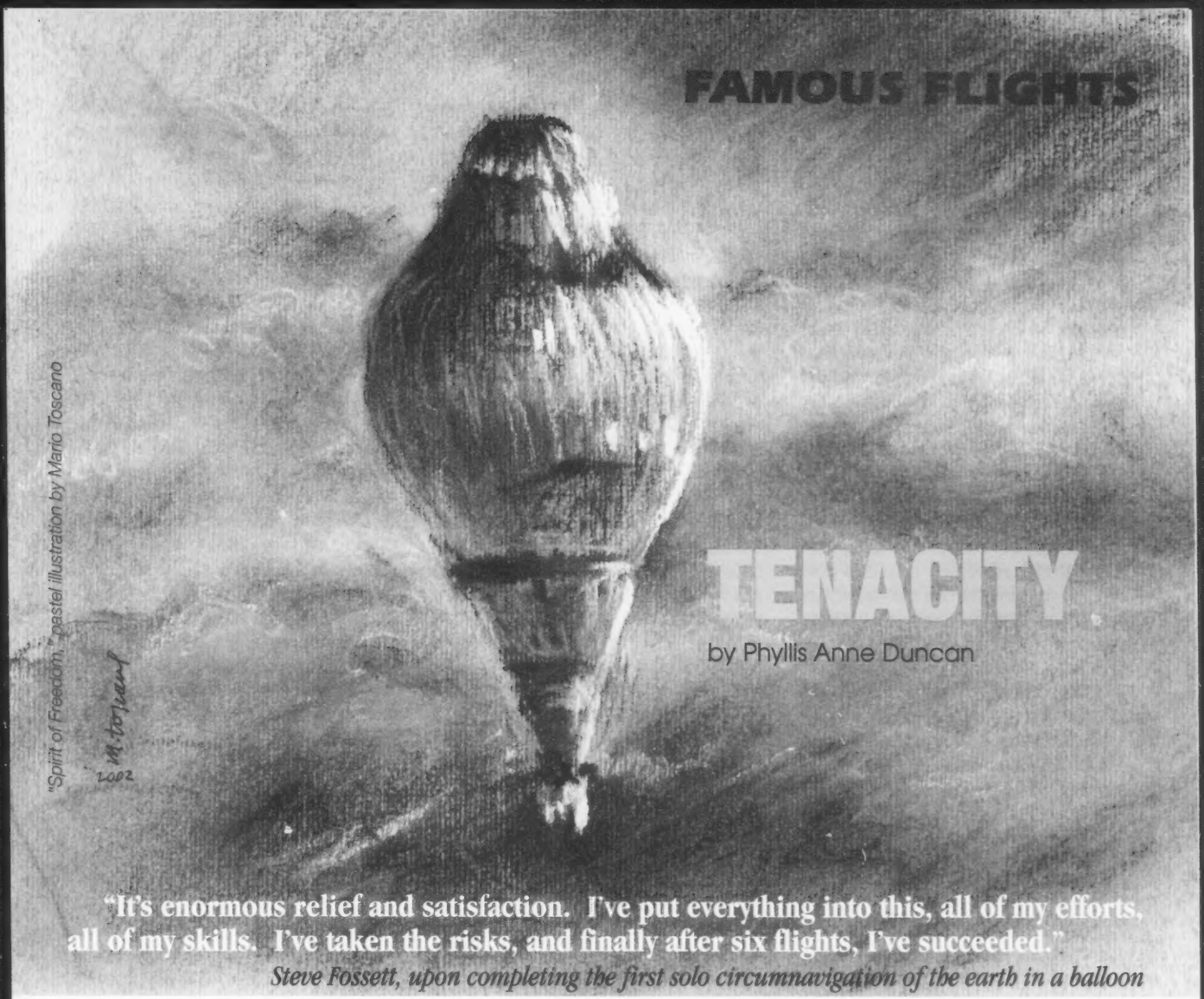
The basic elements of an IEP include independent, defined responsibility; top management review; a continual process; an internal evaluation schedule; corrective action plans; and records. A detailed explanation of each of these elements can be found in AC 120-59 (Part 121/135 operators) or AC 145-5 (repair stations). The advisory material and supporting documents will explain the program in detail and provide suggestions on how an air carrier/repair station can develop its own program. The advisory material also includes examples (models) of various IEP organizational structures to accommodate different air carrier needs.

Certificate holders "form fit" the elements of the IEP to develop their own unique program. In a partnership effort, FAA principal inspectors can offer assistance and guidance using FAA internal guidance material, industry advisory material, supporting documents, best practices, and more. Air carriers should develop a program to include maintenance, operations, and security, but may also include other areas. Initial air carrier programs may start with any one of the three (maintenance, operations, security) and then add others when appropriate.

Repair stations should include the entire repair station processes from incoming inspection to approval for return to service, including the use of contractors. A repair station IEP will strengthen Joint Aviation Authorities' (JAA) requirements for a Quality Monitoring system. The Quality Monitoring function, as defined by the JAA, includes independent, regular audits and emphasizes the role of an accountable manager. Both of these are also basic characteristics of an IEP, which also includes the requirements of a Quality Monitoring process. Additionally, an IEP will support the new Part 145 requirement for a repair station capability list self-evaluation (14 CFR §§ 145.209 and 145.215).

The FAA strongly encourages and will assist in the development and implementation of such a program, but can not approve or accept it. Such a voluntary program will help strengthen a certificate holder's management organization and systems. This method of a methodical and planned systematic self-surveillance and self-evaluation will benefit the air carriers and the repair stations and result in increased safety for the public.

*Salvatore Scalone is the Supplemental Unapproved Parts (SUP) Coordinator for FAA's Eastern Region.*



"Spirit of Freedom," pastel illustration by Mario Toscano

# TENACITY

by Phyllis Anne Duncan

**"It's enormous relief and satisfaction. I've put everything into this, all of my efforts, all of my skills. I've taken the risks, and finally after six flights, I've succeeded."**

***Steve Fossett, upon completing the first solo circumnavigation of the earth in a balloon***

Back when my parents were trying to get my mind off being a pilot, I had my requisite adolescent girl equestrian phase. I really went in for the jumping, because, well, you were airborne for a few seconds, but I didn't bother to point out to my parents that their ruse had not worked. I remember when I reached a specific stage, my father bought me a "real" horse, one that would be competitive in the events I was participating in. There was only one problem—this brute did not like to jump, so he and I quite often parted ways—literally—when we reached a fence and he decided, nope, not today. Granted that I'm stubborn and wasn't about to let something with a brain the size of a walnut get the best of me, one afternoon, this horse and I approached the same fence several dozen times—all with the same result. He would balk, and I would do whatever I needed to do to keep from hitting the ground. I ended up clinging to his neck, the saddle, anything to not have to pick myself up and dust myself off.

It was quite the clash of wills—walnut brain against stubborn teenaged girl—but in the end, the horse took the jump and never hesitated again.

There is a fine line between tenacity and stubbornness, and perhaps whenever we achieve something meaningful in life, when we overcome those who say something can't be done, it just might be because of the right balance between tenacity and being mule-headed. Taking on and finally establishing an elusive aviation record involves tenacity, perhaps a bit of stubbornness, but mostly perseverance—keeping focus on the goal when others around you tell you why it can't be done. Steve Fossett persevered when so-called experts said he might die trying to be the first person to fly a balloon around the world alone. Five times he and the balloon approached that fence, and five times there was a refusal. The sixth time, as

the overused media cliché has it, was the charm.

This past summer Fossett took the hurdle and actually more than set the record—weather conditions prevented him from landing for another whole day after he had entered the record books. (The situation got dire enough that he considered going low enough for the gondola to snag trees, an unusual braking alternative that could have been catastrophic.) In the end all was well, and after sleeplessness, cold, and an in-flight burner freeze-up, the Federaltion Aeonautique International certified his feat—the first circumnavigation of the earth in a balloon in the Southern Hemisphere and the first circumnavigation in a balloon crewed by only one person. In addition he has the record for the longest distance flown by a single person in a balloon, and he broke his own record from a previous attempt. The distance he covered was almost 22,000 miles. He also broke the record for the longest duration in a balloon for one person—he was in the air more than two weeks.

Three years ago Bertrand Piccard and Brian Jones circumnavigated the globe, establishing themselves as the first team to circumnavigate the earth in a balloon. Considering that balloons have been aviating since 1783, that goal eluded balloonists for more than 200 years. To qualify for the circumnavigation record, the balloon has to cross the same latitude it launched from. In Piccard's and Jones' trip, they departed Chateau d'Oex in the Swiss Alps and landed 19 days, 21 hours, and 55 minutes later in the Egyptian desert. Fossett's duration was not considered to have broken that duration record because he opted for the Southern Hemisphere route which was shorter in distance than Piccard's and Jones', who opted for a route closer to the earth's equator.

Fossett's attempts have garnered him praise from many and criticism from some. A self-made millionaire, Fossett fronted his own money for the attempts, though he also had corporate sponsorship, as did Piccard and Jones. The criticism has mostly come from quarters where aviation is little understood. Aviation's history has been a litany of those who wanted to go further, faster, higher. To those of us who have taken aviation into our lives, his persistence is perfectly understandable—though we might envy his largess.

The risks for such a trip are constant, and Fossett was well aware of them, having had five previous attempts at the solo record fail. Oxygen problems, weather, changing winds are all the bane of any high-altitude balloonist. Encountering any of this over the wide expanse of an ocean can be fatal. In this day and age, at least, Fossett was tracked by satellite the entire way; however, had he had to ditch over the Pacific, say, help would still have taken some time to arrive. (Fossett's Mission Control was the same as for Eric Lindbergh's recent flight commemorating his grandfather's solo crossing of the Atlantic, Washington University in St. Louis, MO.)

As daunting as the risks may be, the logistics for this type of trip are numbing. Fossett himself has said that he has learned from the mistakes of every previous attempt, his own and others, and this time he was taking no chances. His balloon, named the Spirit of Freedom, was stocked with fuel, oxygen, and food for a 30-day trip. Given that, he could have gone around the earth twice and still have had a couple of days to spare. However, Fossett himself remarked on the lack of company and the loneliness of the long-distance balloonist. He was in constant touch with his controllers at Mission Control in St. Louis, but a distant voice over a radio is not the same as having a co-pilot to double-check your navigation and various adjustments. Fossett benefited from automation and satellite navigation, but fatigue is a definite factor. Weather is ever-changing, and long bouts of sleep are impossible. You could wake up and find yourself headed opposite of where you intended. The balloon's fuel and other systems have to be monitored and checked, and the on-board auto-pilot only goes so far before human intervention is required. Fossett believes that the longest stretch of sleep he got was four hours.

Some past attempts from different latitudes have encountered the hostile country air space issues. This was a potential problem for Piccard's and Jones' flight, but Fossett's route selection in the Southern Hemisphere eliminated that problem for the most part. Still, Fossett's Mission Control had to have appropriate clearances for the countries the Spirit of Freedom would cross, so that those countries could coordinate their own air traffic control issues. Again, most of Fossett's flight was over international waters, and those countries he did fly over were forthcoming with permission. (In 1999, Piccard and Jones could not get permission to cross a Middle East nation know to have hostile intentions, and they had to alter their planning accordingly.)

When you factor in the nerve-wracking loneliness and the lack of sleep, the constant stimulation of having to interpret meteorological data, the accomplishment is all the more remarkable.

Unless you followed the flight on the Internet, the media was scant in its coverage—a sound bite or stock footage here and there. So, here are some of those boring statistics and exhilarating events that actually make Fossett's flight all the more interesting.

## The Balloon

Fossett's Spirit of Freedom is a design known as a Roziere balloon. It uses a combination of helium and hot air to fly. The balloon envelope, at 140 feet tall (roughly the height of a 10-story building) and 60 feet wide, can hold 550,000 cubic feet of helium plus 100,000 cubic feet of hot air. The heating is accomplished using up to three burners and a fuel mixture of propane and ethane, highly flammable. Forty tanks of the fuel festooned the outside of the capsule.

## The Crew

Technically, as far as the FAA is concerned Steve Fossett is the only

crew, but without a lot of people on the ground and at his control center, he would not have succeeded. Among those who helped make the flight a reality are:

- Project Manager Tim Cole, who is responsible for the development and operational readiness of all the Spirit of Freedom's systems.
- Chief Meteorologist Luc Trullemans and Assistant Meteorologist, David Dehenauw, who review the weather, calculate the projected balloon trajectory, and recommend route adjustments to the pilot.
- The Australia Launch Team: Launchmaster Dennis Brown, Systems Director Bert Padelt, and Inflation Director John Kugler.
- Capsule Builder Andy Elson, who is in final preparations for his own balloon altitude record attempt.
- Mission Control Director Joe Ritchie.
- Air Traffic Control Coordinators Kevin Stass and Barry Tobias.
- Spirit of Freedom Web Site creators and maintainers Barry Tobias and Jared Macke, both Washington University students.
- Media Coordinator Emily Fredrix.

## The Journey

Fossett departs Northam, Western Australia, on June 19 at 0937 Central Daylight Time (CDT). Rising at some 450 feet per minute, the Spirit of Freedom heads east at 60 miles an hour and soon reaches 20,000 feet. At that rate of speed, though he eventually exceeds 62 miles per hour, it takes Fossett a day to cross Australia. In 24 hours, he has covered nearly 1,600 miles.

On June 21, Fossett's balloon is making 80 mile per hour as he crosses the International Dateline. Cruising at 24,500 feet, he has been in the air 70 hours and traveled almost 4,000 miles.

Then, on June 23 comes a critical change in the weather. The jet stream Fossett is riding suddenly splits, and the balloon is caught in the track with the unfavorable winds and storms. After consulting with Mission Control, Fossett descends to 900 feet above sea level—yep, you read that correctly. 900 feet ASL. He also slows to 20 miles an hour to avoid the storms; yet, he still gets caught in some downdrafts which push the balloon to within 400 feet of the ocean. There are times when Fossett has all three burners on full flame to stay out of the water. He manages to skirt the storms and reaches clear sky. The Spirit of Freedom climbs back to 24,500 feet but is only moving at 35 miles per hour.

Barely a day after dealing with unexpected weather, the next problem arises. One of the burners has malfunctioned, and Fossett later admits it could have been a mission-ender. The burner is frozen open, continually heating the air and causing the balloon to rise. If the balloon exceeds its service ceiling, it could lose its helium and not be able to stay aloft. Fossett—remember my earlier words about tenacity and stubbornness—searches about the capsule for a solution and finds it in an unlikely place. His food containers have chemical packs which heat the food, and an idea dawns. Fossett takes several of the chemical packs, climbs outside the capsule, and tapes the activated chemical packs around the burner. The heat thaws the burner, and he has control of it once more. The balloon settles at a more reasonable altitude of 22,500, having covered more than 6,500 miles to this point.

Two days after the burner incident, on June 26, Fossett gets caught in an oscillation cycle which last for three hours. This yo-yo effect—getting caught in a downdraft and having to use full burner to recover, over and over again—causes the balloon to miss a jet stream that would have taken it north of a Chilean low pressure system. Again, using the burners at full flame superheats the helium and sends the balloon higher and too close to its service ceiling. Finally stabilized, Fossett is headed east-northeast, when he wanted to be headed north to catch that jet stream and avoid the weather in the low pressure system. After conferring with meteorologists at Mission Control, another jet stream is detected, and the balloon descends into it. Though the balloon is moving slower, it has encountered a better jet stream, which cuts four hours off the leg to Chile but more importantly keeps Fossett out of bad weather over the Andes.

On June 27 at 0452 local time, Fossett is halfway through his flight and over the Atlantic Ocean, just shy of 10,000 miles covered. At 25,000 feet he is cruising at 113 miles per hour.

June 29th is the 11th day of the flight, and Fossett and the Spirit of Freedom have traveled 5,400 miles farther east and south than his 2001 attempt. Because of weather ahead of him over South Africa, Fossett descends to 12,000 feet. The balloon slows down, but this gains him time for the weather to dissipate. At the high altitudes, the balloon's envelope has been covered with ice. In the warmer air at 12,000 feet, the ice melts, and Fossett likens it to rain on the gondola.

Fossett breaks his own record for longest solo balloon flight on June 30. In 1998 on an attempt, he traveled 14, 235.3 miles before having to abandon ship—literally. He departed from Argentina on the 1998 attempt and ditched in the Coral Sea. The finish line for the 2002 attempt is now "only" 4,000 miles away, and Fossett has caught a fast jet stream that sends him toward his goal at 138 miles per hour!

"Life is good," is Fossett's report to Mission Control on July 1. He has descended to avoid stormy weather but then was able to climb back to 24,000 and catch winds off the east coast of Africa. Some 14,257 miles behind him, Fossett achieves his highest speed for the flight—200 miles per hour.

Even on the day he achieves his dream, the weather won't cooperate. On July 2, Fossett has to climb to 34,700 feet to get above clouds and snow flurries (it is winter in the Southern Hemisphere). That done, he returns to 28,000 feet and is cruising at 63 miles per hour. On a due-east course, at 0853 Central Daylight Time, two days shy of America's Independence Day, Steve Fossett and the

Spirit of Freedom cross 116.42.16 east longitude over the ocean south of Northam, Western Australia.

He has done it, but the weather, not caring that a tired and lonely aviator is eager to touch down, has its last laugh. The winds are too strong for a safe landing near the launch point. Balloonists prefer to land in light or no wind, so Fossett flies on for another day hoping for more favorable conditions. Ahead of him now is the Australian Outback, and he is being followed by his ground crew, who will be on the spot to assist however they can with the eventual landing. The winds, however, still refuse to cooperate. At nearly 20 knots, they are were intense, but Fossett determines that a landing can be managed—to prevent dragging, the balloon's envelope can be detached from the capsule. The landing might be rough, but at least Fossett would be on the ground.

But, fate dealing another blow at the last minute, the control inside the capsule to detach the envelope does not work. Fossett later remarked that, had he landed with the envelope still attached, in those winds he could have been "dragged forever." His tenacity still strong at the end of his journey, Fossett has his ground crew get ready. Fossett slows the Spirit of Freedom as much as he can and descends within reach of the ground crew. They grab the rip cord on the outside of the capsule and detach the envelope. The envelope flies on in the wind, but the capsule, tenacious Steve Fossett inside, thumps to the ground. A voyage which took 80 days in fiction, ends after two weeks. Fossett himself places the call to Mission Control to tell them he is down and safe. Amid cheers and celebrations, his support crew hold up signs which read, "Mission Impossible, Accomplished!"

Indeed.

I was on vacation the last week of Fossett's incredible journey, but I checked the news every day, several times a day to see his progress. When I saw that he'd made the full circumnavigation, I wondered what was next for this remarkable aviation pioneer. Time to rest on one's laurels, accept the kudos of a world full of admirers? Kick back with a few cold ones supplied by his sponsor? Not Steve Fossett. Immediately after confirming that the Spirit of Freedom's capsule would rest in the Smithsonian Air and Space Museum close by the Spirit of St. Louis, Fossett began planning his next record attempt—flying a glider into the stratosphere.

Do you have any doubts he'll get there? I don't.

*Our apologies for using a four-year old photo of Fossett taken at the Albuquerque Balloon Fiesta with the Junior Cadets. His sponsors would not provide us a photograph of him or the Spirit of Freedom to use in the magazine—unless we wanted to pay a price that a government publication funded by its subscribers' fees couldn't afford. When the capsule is installed at the Air and Space Museum, I'll walk across the street and shoot a pix myself.*

*Mario Toscano photo*

# Cospas-Sarsat: Saving Lives for 20 Years

by NOAA

Thanks to the international humanitarian program known as Cospas-Sarsat, which is celebrating its 20th anniversary in October 2002, more than 14,000 lives have been saved worldwide, including about 5,000 in the United States, since the program began in 1982. Cospas-Sarsat is a search and rescue system that uses U.S. and Russian satellites to detect and locate emergency beacons carried by aircraft, ships, or individuals in distress. Last year, 166 lives were saved: 112 on the seas, 39 in the Alaskan wilderness, and 15 on downed aircraft in states around the country.

The National Oceanic and Atmospheric Administration (NOAA) operates a series of polar-orbiting and geostationary environmental satellites that detect and locate aviators, mariners, and land-based users in distress. These satellites, along with a network of ground stations and the U.S. Mission Control Center in Suitland, MD, are part of the International Cospas-Sarsat program, whose mission is to relay distress signals to the international search and rescue community.

Sponsored by Canada, France, Russia, and the United States, and started during the Cold War, the system operates 24 hours a day, 365 days a year, and aims to reduce the time required to alert rescue authorities whenever a distress situation occurs. In the United States, the Cospas-Sarsat program is operated and funded by NOAA, the U.S. Coast Guard, the U.S. Air Force and the National Aeronautics and Space Administration (NASA).

"We are an international humanitarian program whose goals and rewards are the same—saving lives," said Ajay Mehta, manager of NOAA's Sarsat program.

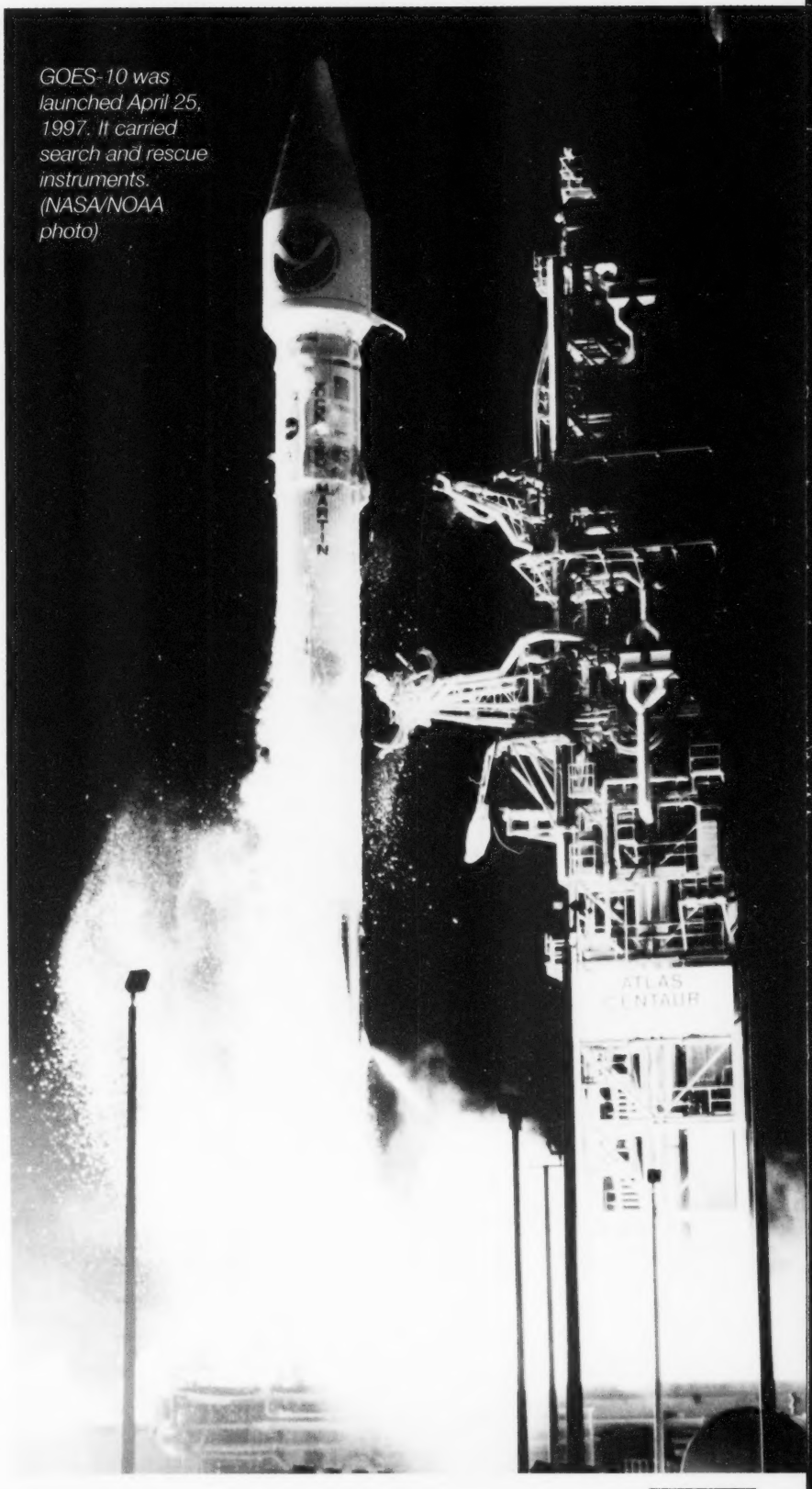
"We had an unusual rescue last year with a bear circling a private plane that had crashed in Alaska with two people on board," said Mehta. "These folks were in a dangerous predicament. Yet, because there was an emergency locator transmitter on board the aircraft that

activated upon impact, rescue authorities were able to respond to the distress quickly. On arrival the search and rescue aircraft saw the situation unfolding and dispatched a helicopter to retrieve the occupants and bring them to safety."

## How It Works

The Cospas-Sarsat system consists of emergency radio beacons carried on aircraft and ships, equipment on satellites, ground receiving stations (also called Local User Terminals), Mission Control Centers, and Rescue Coordination Centers. When an aircraft, ship, or person is in distress, an emergency beacon is activated. These beacons transmit distress signals to the satellites on either the 121.5, 243, or 406 MHz frequency. In the case of aircraft, the beacons are well known by pilots as Emergency Locator Transmitters, or ELT. Ground stations track satellites in the Cospas-Sarsat constellation and process the distress signals. The processed information is then forwarded to a Mission Control Center where it's combined with other information and passed to search and rescue authorities.

The ground station receives the emergency signal and calculates the location of the signal by one of two methods. In the case of 121.5 and 406 MHz signals detected by polar orbiting satellites, the position of the distress beacon is computed using Doppler technology (the relative motion between the satellite and the emergency beacon). In the case of 406 MHz signals detected by geostationary satellites, only those beacons equipped with GPS capabilities can be accurately located. This position can then be transmitted as part of the distress signal to a mission control center. In the United States, NOAA operates 14 Local User Terminals (LUT) in seven locations. There are two LUT in each of the following locations: Suitland, MD; Houston, TX; Vandenberg AFB, CA; Fairbanks, AK; Wahiawa, HI; San Juan, Puerto Rico; and Andersen AFB, Guam. There are currently 39 LUT in operation worldwide with sev-




*GOES-10 was launched April 25, 1997. It carried search and rescue instruments. (NASA/NOAA photo)*

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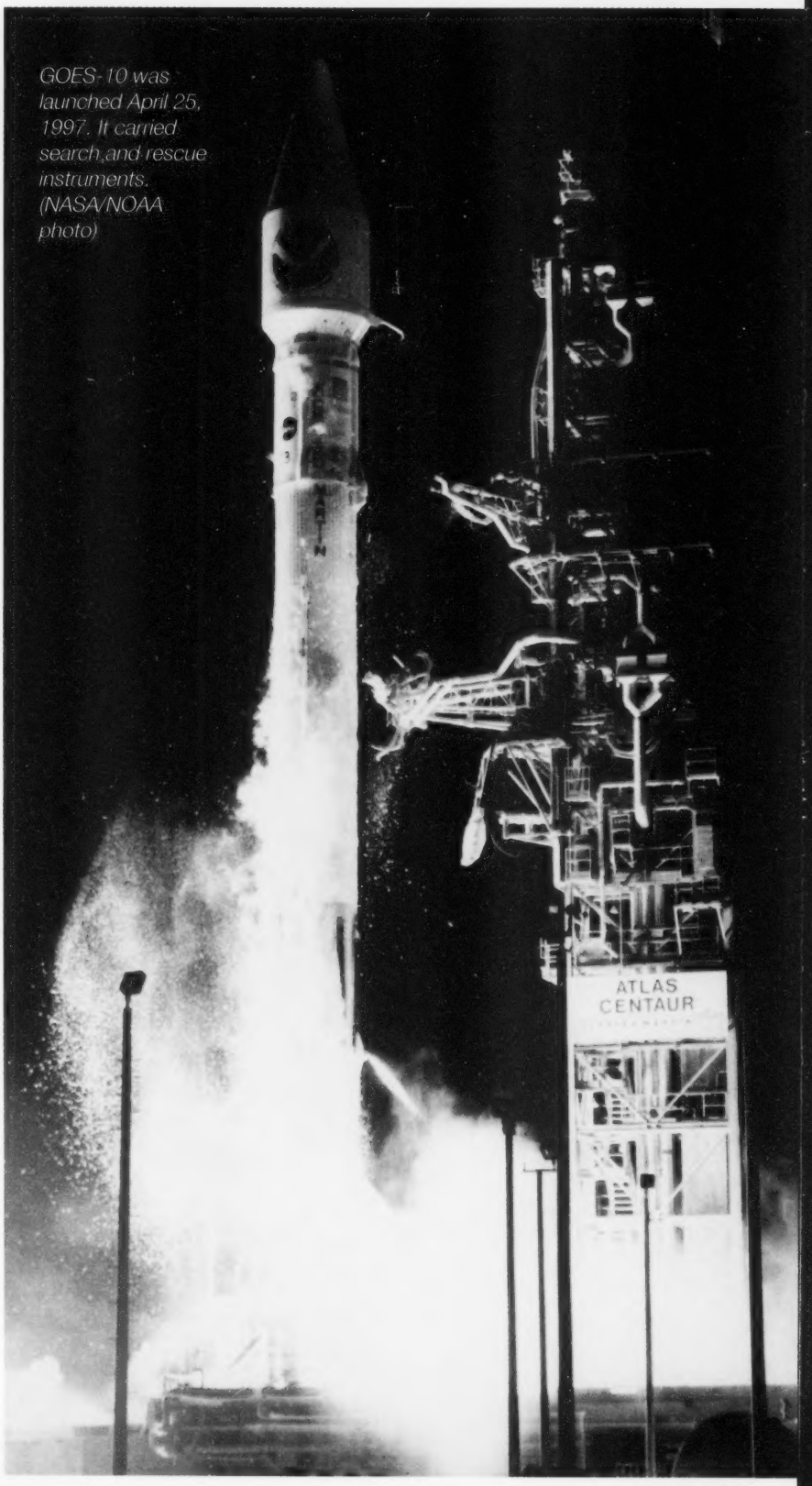



*GOES-10 was launched April 25, 1997. It carried search and rescue instruments. (NASA/NOAA photo)*

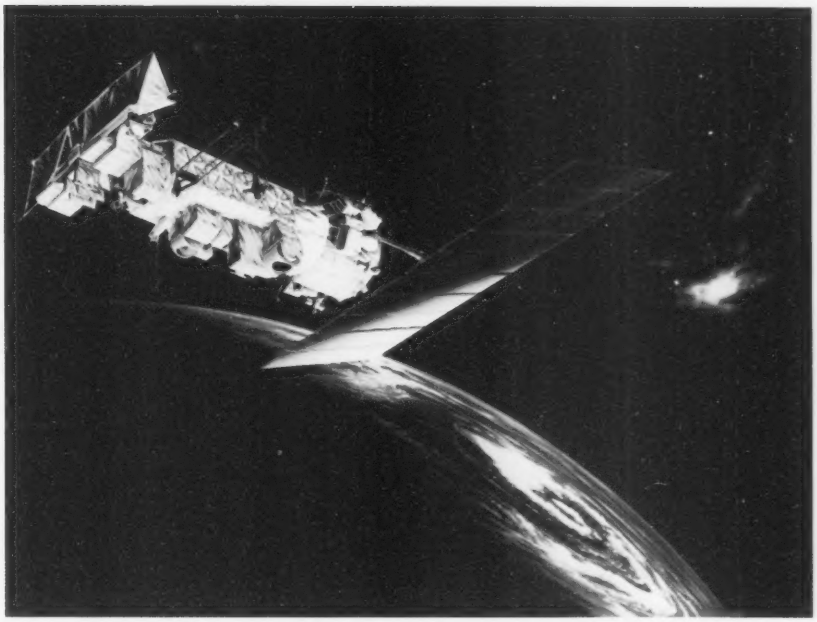
eral more being built each year.

The U.S. Mission Control Center (USMCC) in Suitland, MD, obtains the location information from the ground receiving stations. The USMCC combines this information with other satellite receptions (from other ground stations and MCC), further refines the location and generates an alert message. This alert is then transmitted to the appropriate Rescue Coordination Center based on the beacon's geographic location and/or identification. If the location of the beacon is in another country's service area, the alert is transmitted to that country's MCC. This is possible because all Cospas-Sarsat MCC are interconnected through nodal MCC that handle data distribution in a particular region of the world. Currently, there are 24 MCC worldwide (five of which are nodal MCC operated by the United States, France, Russia, Japan, and Australia). Although the operation is always manned, the vast majority of alert data distribution is handled automatically.

Once the Rescue Coordination Center is alerted, it begins the actual search and rescue operation. In the United States, these rescue centers are operated by the U.S. Coast Guard for incidents at sea and by the U.S. Air Force for incidents on land. In the case of NOAA-registered 406 MHz beacons, the RCC telephones the beacon's owner and/or emergency contact, and if it cannot determine that the signal is a false alarm, it dispatches search and rescue (SAR) teams to locate the aircraft or vessel in distress.

In the case of 121.5 MHz beacons, which cannot be registered with NOAA, each distress call, whether real or a false alarm, must be tracked to the source using direction finding equipment. The manpower and cost of responding to false alarms are extremely high. To avoid false alerts, NOAA recommends that pilots be sure to use care when testing and maintaining their ELT and follow the manufacturer's recommendations carefully.

Search and rescue forces are sent out by either the U.S. Air Force, the U.S. Coast Guard or local SAR personnel depending on the origin of the emergency signal. SAR forces include fixed wing aircraft, helicopters, ships, boats, search parties, and sometimes commercial ships. The SAR forces find the people in distress and bring them to safety. To focus the SAR team's initial search, all 121.5 MHz and most 406 MHz beacons transmit a second "homing" frequency of 121.5 MHz. Armed with radio detection devices, the Coast Guard and other rescue authorities can track the homing frequency and quickly locate the emergency beacon.

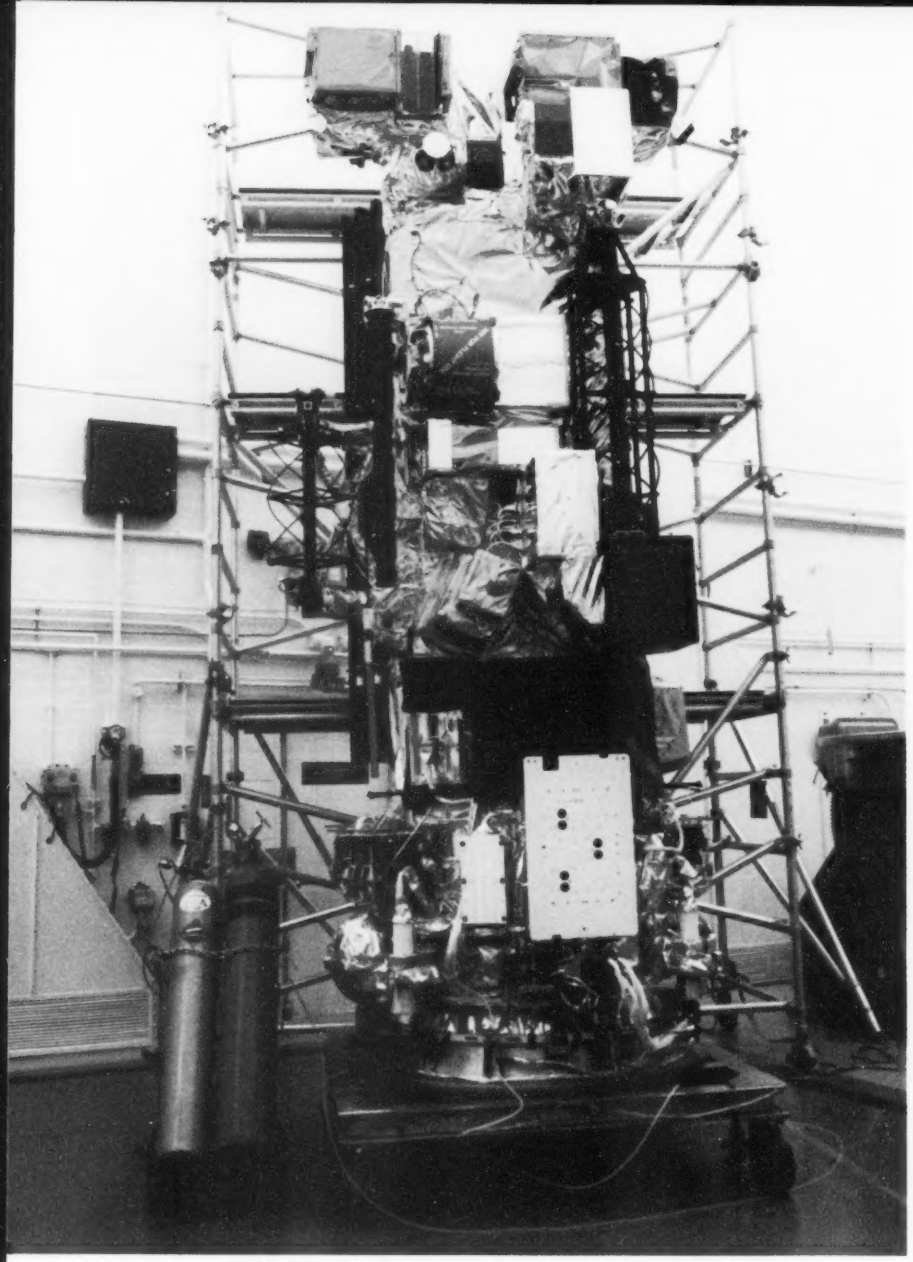


A Cospas-Sarsat polar satellite will typically overfly a beacon within an hour and calculate a Doppler-determined location. This process can locate beacons within an accuracy of 5-12 miles for 121.5 MHz beacons and 1-3 miles for 406 MHz beacons. The 406 MHz beacons detected by geostationary satellites provide immediate alerts. However, they are not able to be located using the Doppler shift because these satellites have no relative motion between them and the emergency beacons. They can, however, be registered in NOAA's beacon database. Thus, if the 406 MHz beacon has been registered, the SAR team can begin its initial verification of the alert using the information contained in NOAA's beacon registration database. Often this detective work yields a general location of the vessel or aircraft in distress and SAR assets can be readied or dispatched to that general area. Then, when a polar orbiting satellite flies over the beacon, its exact location can be calculated using the Doppler shift and the location forwarded to the SAR personnel who may already be en route.

## Satellites

NOAA operates both polar-orbiting and geostationary environmental satellites that are used primarily for environmental applications. Each satellite also carries Search and Rescue Satellite-Aided Tracking (Sarsat) payloads that can detect and locate emergency beacons activated by people in distress

NOAA's Polar Orbiting Environmental Satellites circle the earth every 102 minutes at an altitude of about 850 km (526 miles). The Russian Cospas polar satellites circle the Earth every 105 minutes at an altitude of about 1,000 km (620 miles). Antennas aboard the satellites detect both 406 and 121.5 MHz emergency beacon signals and relay them to ground stations. Since the satellites overfly the poles on every orbit, coverage is best there and least at the equator. In



*NOAA-15 before it was launched May 13, 1998, carrying SARSAT equipment. (NASA/NOAA photo)*

the mid-latitudes, the average waiting time for a satellite pass is 30-45 minutes, with quicker passes near the poles.

NOAA's Geostationary Operational Environmental Satellites orbit at about 36,000 km (22,320 miles) above the Earth's equator. From this vantage point, GOES can see large portions of the Earth continuously. GOES satellites can detect only 406 MHz emergency beacons. The more advanced 406 MHz beacons often have GPS capacity, which can provide their position. GOES satellites relay 406 MHz signals to ground stations immediately after a beacon is activated.

## Types of Beacons

Emergency beacons are powered by batteries and come in a variety of shapes and sizes. There are three types of emergency beacons: 1) Emergency Position Indicating Radio Beacons (EPIRB) for maritime applications, 2) Emergency Locator Transmitters (ELT) for aviation applications, and 3) Personal Locator Beacons (PLT) for individuals in distress. There are two types of EPIRB and ELT. One type transmits an analog signal on 121.5 MHz. The other type transmits a digital identification code on 406 MHz and a low-power "homing" signal on 121.5 MHz. Aircraft carry ELT that are normally triggered by the impact of a crash. Ships carry floating EPIRB that are activated by immersion in water. Both can also be activated manually. PLB have been used by the State of Alaska since 1994 to help protect people from the hazards of the Arctic. Although PLB are not yet authorized for general use, the Federal Communications Commission is currently considering rule making to allow use of PLB anywhere in the United States starting in 2003.

## Frequencies

Emergency beacons transmit on a radio frequency of 121.5 MHz and 406.025 MHz. There are several important differences between the two frequencies.

Accuracy: The 406 MHz frequency provides the location of people in distress with an accuracy of about 2-5 km (1-3 miles). The 121.5 MHz frequency provides the location of emergency beacons with an accuracy of about 10-25 km (5-12 miles).

Digital vs. Analog: The 406 MHz signal is digital and can be stored aboard the spacecraft for later relay to the next available ground station (giving it a global capacity). The 121.5 MHz signal is analog and is not stored aboard the spacecraft, thus providing only a regional capability.

Data Encoding Capabilities: The 406 MHz distress beacons can transmit a unique, pre-coded message, which links it to information contained in a registered database. This database can supply the beacon type, its country of origin, emergency points of contact, and the registration number of the maritime vessel or aircraft. The registration information helps the search and rescue forces identify the

vessel or aircraft in distress and greatly speeds up response. 121.5 MHz beacons are not capable of data encoding.

Detection Capacity: Satellites in the system are designed for global reception of 406 MHz beacons. 121.5 MHz beacons can also be detected, but only if a satellite is within range of the beacon and the ground station simultaneously. The 121.5 MHz signal was originally designed for alerting overflying aircraft and is excellent for use as a homing signal. However, because most 406 MHz signals are not suitable for homing many 406 MHz beacons also transmit a 121.5 MHz homing signal (some 406 MHz beacons also have GPS capabilities to further assist in locating distress beacons).

Number: There are approximately 285,000 406 MHz beacons currently in use worldwide. Of those, more than 87,000 have been registered in NOAA's beacon database. There are approximately 590,000 121.5 MHz beacons in use worldwide, primarily on small aircraft.

### Phase-Out of 121.5 MHz Satellite Alerting

The 121.5 MHz beacons, which sell for about $200-$1000 each, will no longer be detected by satellites starting on February 1, 2009. Owners will have to replace them with a more sophisticated type of unit, the 406 MHz beacon, which sells for $500-$2,500 depending on features and application. "The 406 beacons emit a powerful, satellite-compatible digital signal, with an encoded "fingerprint," on a frequency that's reserved exclusively for their use by international regulation," Mehta said. Although they also simultaneously emit a short range 121.5 signal when activated, it is merely a "homer," a steady, localized radio beep that rescuers can use to home in on victims once an accident site has been located. "Combine this double-barreled locator/homer capability with the registration information available for 406 beacons—a search-assisting database containing a beacon's information and emergency phone numbers that can be checked prior to launching expensive rescue efforts, but more importantly provide information that can help save the user's life—and you have an accurate, cost-effective SAR tool," Mehta said.

Comparatively, 121.5 beacons emit weak, inaccurate analog signals that are both confusing to satellites and anonymous, as they cannot accommodate registration information. The 121.5 beacons use a frequency that can be very crowded and have many devices operating around it that can appear as distress alerts. Examples of interfering signals in the 121.5 MHz band include stadium scoreboards, pizza ovens, and automatic teller machines. This results in a staggering number of false alerts, many of which must be dealt with on site. The majority of these alerts have to be ignored, at least until a third or fourth satellite pass confirmation. This is slow process that can delay other rescues by up to six hours.

### Future Developments

The newest technology for Cospas-Sarsat is 406 MHz emergency beacons that digitally transmit their identification and position. These beacons use either an external or internal navigation receiver (i.e., Global Positioning System) and can transmit their position down to 100-meter accuracy. This allows geostationary satellites to combine immediate alerts with precise locations. The polar orbiting satellites are also capable of receiving these signals, thereby providing global coverage.

### Conclusion

The Cospas-Sarsat system provides a tremendous resource for protecting the lives of aviators and mariners that was unthinkable before the Space Age. With a 406 MHz beacon, rescue forces can be quickly summoned from anywhere on Earth—24 hours a day, 365 days a week. "The number of people rescued continues to rise internationally as more countries and people sign on to use the advantages and benefits of the Cospas-Sarsat system," said Mehta.

To learn more about NOAA's role in the Cospas-Sarsat program: <http://www.sarsat.noaa.gov>. Visit the international Cospas-Sarsat program at: <http://www.cospas-sarsat.org>

# FAA CHANGES FOREIGN PILOT CERTIFICATION

As a result of the many governmental changes that have occurred since the September 11, 2001, terrorist attacks, on July 16, 2002, FAA stopped issuing U.S. pilot certificates to foreign pilots based upon their foreign pilot licenses. That ban continued until FAA's Flight Standards Service issued a notice late in July explaining its new issuance process.

The basic process has not changed. However, any foreign pilots wanting a U.S. private pilot certificate issued on the basis of their equivalent foreign private pilot or higher level pilot certificate must now submit to FAA at least 60 days in advance the following information as part of a pre-application process. The FAA will use the information to verify the authenticity of the applicant's pilot certificate. Complete instructions and the new Verification of Authenticity form are available on the Internet at http://registry.faa.gov. The applicant must submit either the completed form with the required attached documents or a legible hand-written or

*(Continued on the next page)*

## FAA CHANGES FOREIGN PILOT CERTIFICATION

*(Continued from the preceeding page)*

type written letter with the following:

- Name of person
- Permanent home of record. If the paperwork is to be mailed to a separate mailing address, that information must be attached to the package
- The name of the country that issued the foreign pilot license
- The name of the FAA Flight Standards District Office (FSDO) where the applicant plans to apply for a U.S. certificate.
- A statement that the foreign pilot license is not suspended or revoked
- A legible copy of all of the pages of the foreign pilot license
- A legible English translation of the license if it is not in English
- A legible copy of the foreign medical license or endorsement, as appropriate
- A legible copy of a driver's license, passport, or other photo ID

All of this information must be sent to the FAA's Airmen Certificate Branch, AFS-760, P.O. Box 25082, Oklahoma City, OK 73125. The FAX number is 405-954-4105.

The Airmen Branch will authenticate the information with the appropriate foreign civil aviation authority. If the information is correct, the Airmen Branch will send a Verification of Authenticity letter to the designated FSDO. The letter, which expires in 60 days from the date of issuance, is used by the named FSDO as the basis for processing the applicant's certification application. If the letter has expired or not been received by the FSDO, the FSDO can not process the applicant's paperwork. The Title 14 Code of Federal Regulation Section 61.75, Private pilot certificate issued on the basis of a foreign pilot license, application process remains the same.

# RUNWAY SAFETY CORNER

## Runway Incursions —An Update

by Robert Martens

If you asked aviation experts to rank the major safety issues facing us today, the runway incursion issue might not be at the top of the list. It might not even be close to the top. So, why is the FAA so focused on this issue? A good question!

I think the answer is very simple. While the probability of runway collisions is not particularly high, the consequences are devastating. The worst single tragedy in aviation history occurred on a runway in Tenerife—583 fatalities! And some of the recent occurrences are equally terrifying. By a matter of a few feet, we avoided tragedies at Providence, RI, and Chicago, IL. On a beautiful morning in Sarasota, four aviators lost their lives when a Cessna 152 and Cessna 172 collided on the runway. The price of failure in the runway environment is very high!

I refuse to get caught up in the numbers game, because we can make the numbers suit our needs, but some Office of Runway Safety findings are quite revealing. By looking at airport signs and markings we have discovered there are much more effective ways to get the job done. We have removed and improved confusing and even misleading signs and markings. And we have looked at ourselves to understand some of the human characteristics that interfere with runway safety.

At one airport, the tower was intentionally having pilots hold short of a parallel taxiway to ease the taxi flow. Unfortunately, because of the position of the hold short lines, the controller was unintentionally keeping the pilot "on the runway" by not letting them clear the hold short line. At the same airport, there were hold short lines on a taxiway that were routinely ignored because of their mid-taxiway location. That's not a good habit to develop.

We learned that our training environment can often leave gaps in our training. If we train at a non-towered airport, movement area markings are not part of our daily routine. Might this be a problem as we head out to other airports?

We kid ourselves if we do not accept that taxiing has the potential to be one of the more complex actions that we undertake in the course of any flight. Loss of situational awareness, breakdowns in communication, and the absence of an airport diagram can easily lead us into a catastrophic situation. Failure to recognize these problems has brought about Tenerife, Los Angeles, Taipei, Milan, and Sarasota.

Keep in mind that it is not only the "guilty" party who pays the price! Runway collisions kill many innocent parties. This reason alone moves this issue to the top of my list of aviation safety concerns. Am I ready to die because someone else missed a hold short line or radio call?

Only when we realize that ALL the players on an airport share in the responsibility for the success of this effort will the battle be won. Education, training, improved signage and markings, and effective communication programs are solutions that will allow us to eliminate runway collisions. Are you doing your part?

*Robert Martens is the Safety Program Manager at the Windsor Locks FSDO, CT.*

## • IFR Procedure Turn

*This Flight Forum question relates to when a procedure turn is required during an instrument approach.*

I know that this e-mail question will be longer than appropriate for complete inclusion in Flight Forum and I expect that you will edit it as needed, but I wanted to assure that the question was as clear, explicit, and complete as I could make it. Please forgive the length.

The situation is that a pilot is flying toward an initial approach fix (IAF) located on the final approach course. He is following a course such as a radial from a nearby VOR which helps to define the IAF. This radial information is printed on the terminal chart. The term NoPT is not printed by this radial. The airplane is not under radar control. The turn to the final course is less than ninety degrees. A holding pattern in lieu of a procedure turn exists at this IAF. The airplane will be at the appropriate altitude to commence the approach upon arrival at the IAF and the pilot has been cleared for the approach.

Question: Is the pilot required (or expected) to fly a procedure turn (in holding) before proceeding inbound on the approach?

In the *Aeronautical Information Manual* (AIM) the first two sentences of paragraph 5-4-8a PROCEDURE TURN reads as follows: " A procedure turn is the maneuver prescribed when it is necessary to perform a course reversal to establish the aircraft inbound on an intermediate or final approach course. The procedure turn or hold in lieu of procedure turn is a required maneuver."

The intent of the first sentence, specifically the words "when it is necessary to perform a course reversal", appears to be that if a course reversal is not needed then a procedure turn is not prescribed.

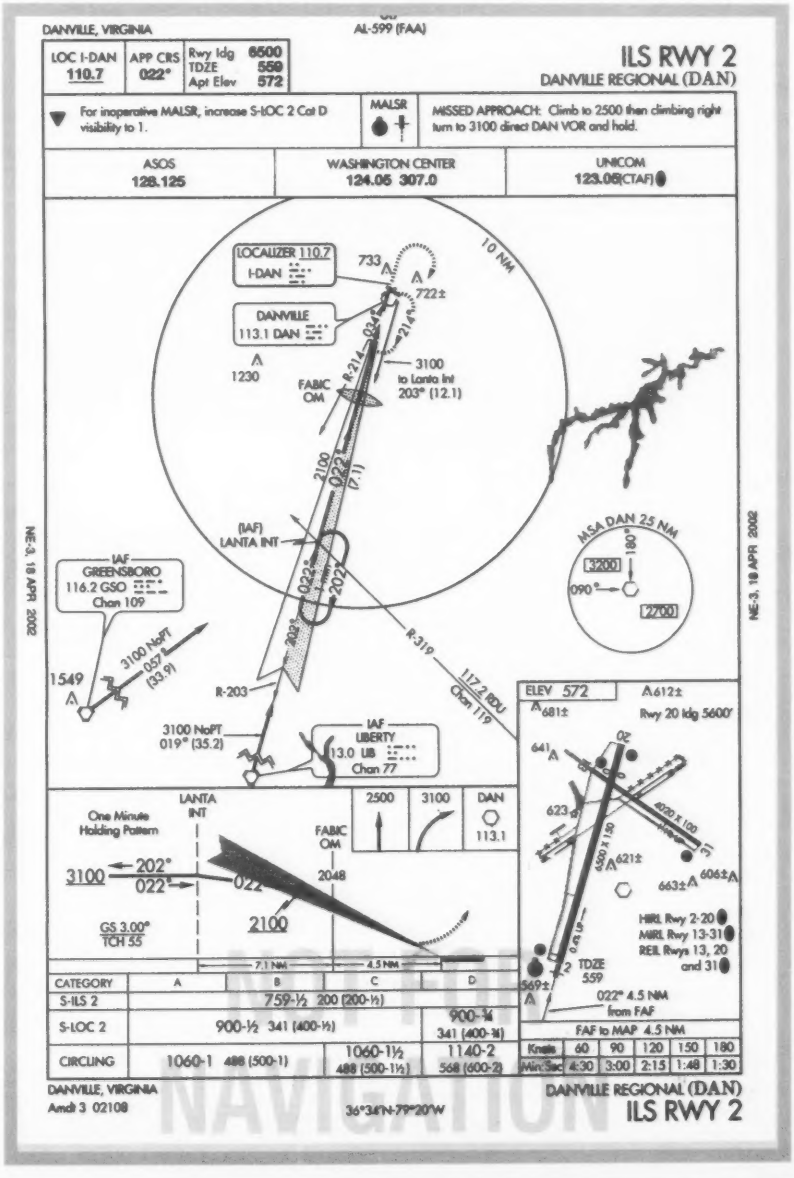
The second sentence and the subsequent elaborations in paragraph 5-4-8 on when a procedure turn is to be performed raise some doubts about the intent of the first sentence and how the pilot should interpret that intent.

One interpretation would be such that the answer to the question posed above would be "No. Since no course reversal is required then no procedure turn is required".

If the FAA has a different interpretation of the intent of the first sentence of paragraph 5-4-8 of the AIM or has a different answer to the question posed above, I would appreciate knowing that answer and having an explanation.

To give some specificity to the general approach situation described above I cite the following two examples:

A) The airplane is proceeding on



the R-135 of the HOPEWELL (HPW) VORTAC at 2,000 feet MSL toward the IAF JAWES in order to fly the ILS RWY 7 approach into Newport News / Williamsburg Intl (PHF). Terminal Chart Amdt 30B 01025.

B) The airplane is proceeding on the R-319 of the RALEIGH/DURHAM (RDU) VORTAC at 3,100 feet MSL toward the IAF LANTA INT in order to fly the ILS RWY 2 approach into Danville Regional (DAN). Terminal Chart Amdt 3 02108.

By the way, a complicating aspect of this issue is that I cannot find a definition of "course reversal" in the FARs or the AIM. My definition is that a course reversal requires a turn of greater than ninety degrees. Is there an official definition of course reversal?

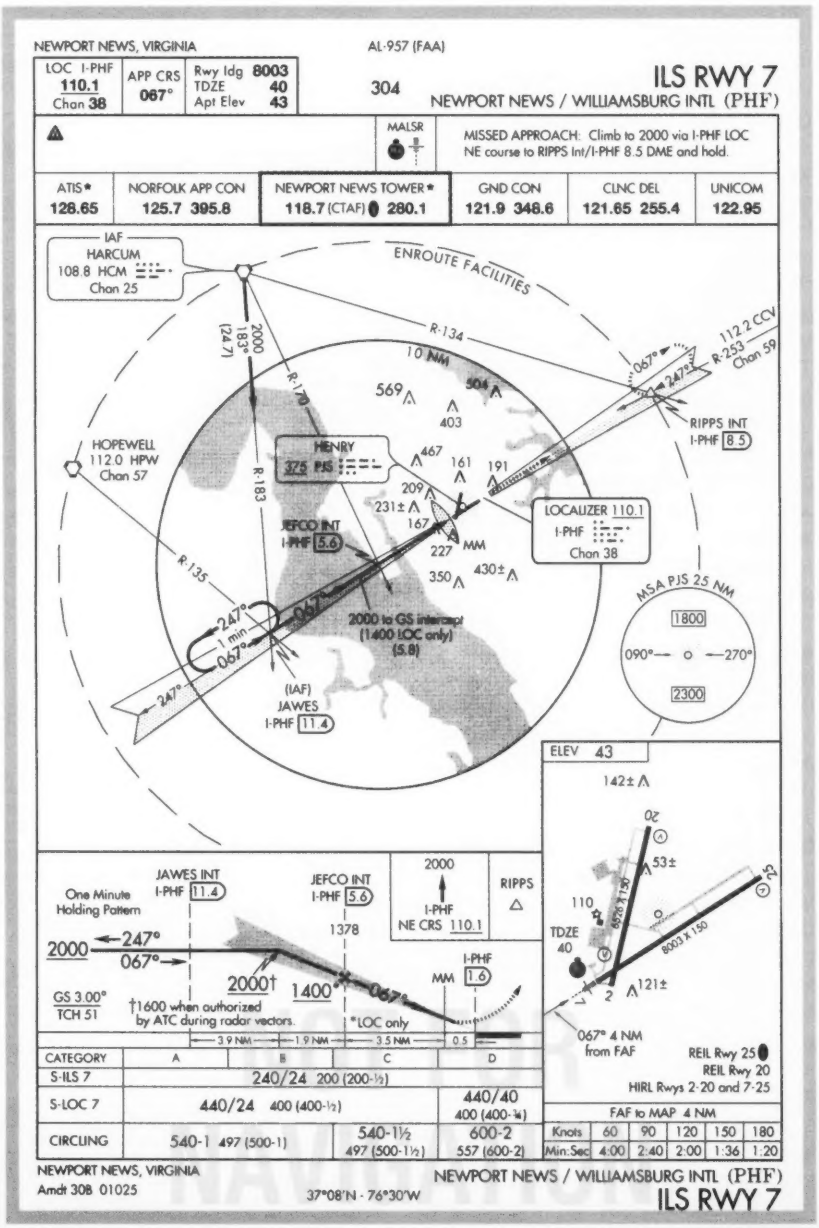
Owen C. Baker
Fairfax VA

*You are right. This is a long question. The answer to the first two questions is found in the new* Instrument Flying Handbook *(IFH), FAA-H-8083-13, page 8-10, paragraph "Holding in Lieu of Procedure Turn." The last sentence notes the holding pattern must be followed, except when radar vectoring to the final approach course is provided or when NoPT is shown on the approach course.*

*Please note neither the IFH or the AIM defines course reversal.*

*FAA AVIATION NEWS* welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov



## SECURITY INFORNMATION ADVISORY REMINDER FOR GA PILOTS

The U.S. Government continues to receive credible indications that extremist individuals are planning additional terrorist operations against U.S. and Western interests within the U.S. and overseas. Such operations, possibly involving civil and general aviation (GA) aircraft, could be carried out whenever attack preparations are complete and operatives are in place. The Transportation Security Administration (TSA) has no credible information concerning specific targets, timing, or methods of attack. However, the GA community should observe good physical security for aircraft and facilities and be continuously on the lookout for suspicious persons, activities, and operations around airports.

Terrorists who are no longer able to hijack commercial airliners because of increased security at commercial airports may turn to GA airports and aircraft to conduct operations.

The TSA asks members of the GA community to report all unusual and suspicious activities. If you observe persons, aircraft, and operations that do not fit the customary pattern at your airport, you should immediately advise law enforcement authorities.

**Your immediate action is requested for these items:**

- Secure unattended aircraft to prevent unauthorized use.
- Verify the identification of crew and passengers prior to departure.
- Verify that baggage and cargo are known to the persons on board.
- Where identification systems are in place, encourage employees to wear proper identification and challenge persons not wearing proper identification.

**Increased vigilance should be directed toward the following:**

- Aircraft with unusual or unauthorized modifications.
- Persons loitering in the vicinity of aircraft or air operations areas.
- Persons who appear to be under stress or the control of other persons.
- Persons whose identification appears altered or inconsistent.

## TEMPORARY FLIGHT RESTRICTIONS

Temporary Flight Restrictions (TFR) are in place in many states, but these TFR's are not shown on sectional or other aeronautical charts. Textual information is available through the Flight Service Stations (FSS) or DUATS. There are also graphical depictions available AT <http://www.faa.gov/NTAP/index.htm> (click on Special Interest NOTAMs) for the following three TFR's: Thurmont, MD (Camp David); Washington, DC; and Crawford, TX. These graphics are for reference only but will aid pilots in planning their flight paths to remain clear of these airspaces. Violators of these TFR's will be escorted to the nearest airport by airborne military escort.

## GA FATALITIES DOWN, 2001 TRANSPORTATION FATALITIES UP — 9/11 EVENTS MAIN FACTOR

According to the following National Transportation Safety Board (NTSB) media release, transportation fatalities in the United States last year increased 0.6 percent over the total for 2000, according to preliminary figures released July 12 by the NTSB.

For the year 2001, preliminary figures show that 44,461 persons died in highway, aviation, rail, marine, and pipeline accidents, up from 44,196 in 2000. Increases in fatalities were registered in aviation and rail while highway, marine, and pipeline fatalities declined.

Aviation fatalities rose from 779 to 1,162 in 2001, with the increase largely attributable to the deaths resulting from the terrorist acts on September 11. Total airline fatalities, up from 92 the previous year, reached 531, with almost half that number occurring aboard the four aircraft hijacked on September 11. Another 265 deaths resulted from the crash of American Airlines flight 587 in November in New York.

General aviation fatalities decreased from 594 to 553 for the year, with air taxi deaths also declining from 71 to 60. (Detailed aviation statistics can be found in NTSB press release SB-02-06, dated March 26, 2002, on the Board's web site, <http://www.ntsb.gov>).

Highway fatalities, which account for about 94 percent of all transportation deaths, declined slightly from 41,821 in 2000 to 41,730 in 2001. Fatalities at roadway/railway grade crossings also declined from 425 to 418.

Total rail fatalities increased in 2001 to 795 from 770, reflecting a rise in pedestrian fatalities associated with intercity rail operations. Deaths among passengers on trains declined from 4 to 3 for the year. Fatalities occurring on light rail, heavy rail, and commuter rail dropped from 194 to 175. (Because of peculiarities in reporting requirements, there may be some duplication in the numbers for intercity rail and commuter rail.)

Marine fatalities in 2001 dropped from 801 to 767, with most fatalities

occurring in recreational boating. Cargo transport and commercial fishing fatalities also declined while the number of commercial passenger deaths remained unchanged at 23 from the previous year.

Pipeline fatalities dropped significantly from 38 to 7. Deaths related to gas pipelines decreased from 37 to 7, while there were no fatalities for the year stemming from liquid pipeline operations.

Aviation statistics are compiled by the NTSB. Numbers for all other modes are from the respective Department of Transportation modal agencies.

All numbers for 2001 are preliminary. Statistical tables can be found at <http://www.ntsb.gov/Press-rel/2002/020712.htm>.

## AIR TRAFFIC CONTROL EQUIPMENT UPGRADED

The FAA is continuing its efforts to upgrade the systems that control air traffic. The FAA is making improvements in air traffic control towers and at air traffic control centers, providing enhanced services to the user.

In the air traffic control tower environment, the FAA is upgrading equipment that provides crucial pre-departure flight clearance information, such as weather and airport conditions, via both text and automated voice messages. The Tower Data Link Services (TDLS) upgrades will enhance the reliability of service between tower controllers and pilots.

"TDLS is significant in that it reduces air traffic controller and pilot workload, frequency congestion, and human-induced delay and error," said Gregory Burke, director of the Office of Air Traffic Systems Development.

The upgrade includes changes to system hardware, software, and supporting technical documentation. Philadelphia and Boston Logan International Airports were the first two sites to receive upgrades. Over the next 12 months, the FAA will upgrade 58 high-density airport towers in the U.S. that are currently using TDLS. TDLS is used by 17 major airlines, two general aviation service providers who relay flight information to 1,400 aircraft and two cargo carriers. A new TDLS system was installed at Teterboro Airport in New Jersey last December under a memorandum of agreement between the FAA and the Port Authority of New York and New Jersey.

In the air traffic control center environment, the FAA continues to deliver improvements to its Host and Oceanic Computer System. These measures continue to improve the reliability of control operations by reducing delays caused by equipment failures.

The air traffic control centers are receiving state-of-the-art data storage systems that replace 1980's era equipment. There are currently 11 centers using the new upgrades and the agency expects that all 21 centers will have the new equipment by the end of the year.

The Host and Oceanic Computer processes critical radar and flight management data, provides communications support, and generates display data to air traffic controllers. It also stores the data used to recreate and analyze unusual air traffic control events.

## AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST ARCHITECTURE

The FAA announced the surveillance data links it has chosen for Automatic Dependent Surveillance – Broadcast (ADS-B), a surveillance technology which enables applications that allow both pilots and controllers to have a common picture of airspace and traffic. ADS-B increases safety, capacity and efficiency and is considered a cornerstone enabler for "Free Flight."

The FAA having completed the technical and economic evaluations of the alternative ADS-B technologies, has decided that ADS-B will use a combination of the 1090 MHz Extended Squitter ADS-B link for air carrier and private/commercial operators of high performance aircraft, and Universal Access Transceiver (UAT) ADS-B link for the typical general aviation user.

ADS-B airborne systems transmit an aircraft's identity, position, velocity, and intent to other aircraft and to air traffic control systems on the ground, thus allowing for common situational awareness to all appropriately equipped users of the national airspace system.

This link decision responds to a request from the RTCA Free Flight Steering Committee (an aviation industry advisory committee) to evaluate operational enhancements supported by ADS-B. The RTCA further recommended that the FAA evaluate the ADS-B technology alternatives.

The FAA's link selection is compatible with a joint strategy currently being coordinated between EUROCONTROL and the FAA for implementing ADS-B enabled applications, thus providing for interoperability between the U.S. and Europe.

This decision also means that the agency will actively work with the aviation community to:

- develop and implement beneficial ADS-B applications, thereby stimulating user equipage,
- ensure that ADS-B is globally interoperable,
- develop the necessary standards,
- support spectrum planning, and
- identify equipage requirements (for both aircraft and ground systems).

Further details of the ADS-B architecture decision are available on the FAA website at: <http://www.faa.gov/asd>.

# Editor's Runway

*from the pen of Phyllis-Anne Duncan*

## One Year Later

I recently participated in my local newspaper's commemorative issue for the one-year anniversary of September 11, 2001. The topic was "How Did September 11 Change Your Life?" The rub was that I only had 75 words in which to express it, but I managed to state how it felt to be a pilot and watch what happened that day. Even now, it still seems surreal, like a bad action movie. I suppose it's taken many of us this long to reach denial, which unfortunately means resolution could be a long way off.

This past year has been a tough one for general aviation. Despite the fact that the world witnessed four transport category aircraft used as weapons, the general public, the media, and our elected officials seemed determined to show general aviation as a potential threat. Rumors of restrictions abounded, and three general aviation airports close to Washington, DC remain under tight security. Of course, we got a lot of negative attention in January when a troubled young man decided to kill himself using a general aviation aircraft by flying it into a building. There were the nuclear powerplant TFR's, the incursion of a single-engine aircraft into the Washington, DC TFR, and a couple of yahoos who decided to buzz a cruise ship and a crowded beach near New York City. (How brilliant was that?)

An individual from the new Transportation Security Administration wanted to require background checks for banner towing pilots—before every banner they tow. That was until we explained the waiver process to him. An individual from the Air Marshal Service wanted to know how many general aviation operations occurred monthly at towered airports so that air marshals could be placed on each one. When I told her roughly 1.5 million, she said, "Oh, we'll get back to you." Then, there was the congressional correspondence I had to answer explaining that aerial application is not a terrorist plot, not to mention the telephone call from "John Q. Citizen" (I swear, that's what he called himself) telling me the terror threat of helicopters flying near his house. He wanted the helicopters stopped right away, but he wouldn't tell me where he lived so the local FSDO could investigate. And speaking of helicopters, in July a man fired his rifle at a helicopter landing in a neighbor's pasture, certain it was a terrorist attack.

It's been that kind of year.

The public, the media, and Congress sometimes forget that general aviation is the backbone of this nation. General aviation also moves the mail and organs for transplant, operates pipeline and powerline patrols, searches for missing pilots or other missing persons, carries our corporate executives and sports teams, teaches the next generation of pilots how to fly, and gets our battered bodies from the scene of the car wreck to a hospital in time to save our lives. The positive examples of general aviation far outweigh the teenager's suicide flight, the buzzing idiots, and the potential for general aviation to be used as a threat. Yes, I know that the FAA has issued two "alerts" to general aviation pilots to heighten their sense of airport and aircraft security, but the suggestions offered were common sense recommendations that can be used to safeguard aircraft from terrorists or your garden variety avionics thief.

I'm not trying to play down a threat. It exists, but we are now aware of the potential. Our eyes will be peeled, on the lookout for suspicious people. Believe me, that's far better than a virtual lockdown of general aviation, which many in the public advocated in their letters and e-mails to the FAA after September 11, 2001. It was general aviation, as we know, that trained some of the hijackers, but it was general aviation that also trained many of the pilots who brought some 5,000 aircraft safely to earth on September 11 when U.S. airspace was closed. It was general aviation which trained some of the military pilots who are protecting us here in the U.S. and around the world.

The Aircraft Owners and Pilots Association, building on its previous "Fly a Reporter" program, has advocated taking your Congressman to your local FBO to show him or her the reality of general aviation, not the myth perpetrated by some in the media. That's an excellent idea, as is "Take your neighbor to your local FBO." They're the ones who write Congress, after all.

The burden of September 11, 2001 is widespread. The worst of it falls on the families of the dead and those who got out of the Pentagon and the World Trade Center with their lives. What we in general aviation have experienced certainly does not compare to that, but what we can do, in small ways and large, is show everyone what general aviation really is.

On this significant date one year later, our thoughts are with the victims and the survivors, our troops around the world and here at home. Thomas Jefferson allegedly said it best, "Eternal vigilance is the price of liberty."

'Til next time…

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